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Towards a common culture III

The rise of postwar pragmatism

"Yesterday, all my troubles seemed so far away" ran the refrain of a rather squelchy popular song of a few years ago. A fair comment perhaps on the culture of yesterday, that remarkable mid-century flourishing of common sense pragmatism that succeeded the decay of grand ideology. As this culture provided the version of modernity to which nearly all of us remain particularly attached, it is especially difficult to be objective about its character and qualities. For too many of us it is ours, the ideas, attitudes and habits of our youth or middle years, in any case our best years. It is hard enough to admit that it may now be yesterday; impossible to go further.

Yet from the very start a great dislocation, like a silent earthquake fault, ran through this postwar culture. It can be simply described: in no age was utopianism more out of fashion; yet in no age was greater and more hopeful progress made towards the goals that utopians of the past valued so highly. Nowhere was this dislocation more obvious than in intellectual life. Our claims were modest compared with those made by the ideological giants of the nineteenth and early twentieth centuries; our intellectual and scientific achievements immensely more impressive than theirs. The more we shrank from offering grand explanations, the more effective became the technology of ideas. Postwar pragmatism stood on the moon; prewar ideological man had stumbled through the ruins of Auschwitz and Dresden.

But it was not simply in intellectual life that this contrast could be observed. The ethics of nation, family, religion, work, which previous generations had believed to be the essential cement of a civilized and advanced society, were disregarded and occasionally despised - but the world did not fall apart. On the contrary it advanced to new levels of material civilization, and in circumstances of remarkable social tolerance, political harmony and personal freedom. Immemorial politicians with passionate programmes presided over these great advances in the human condition, which memorable predecessors filled with great passion and guided by grand programmes had failed to achieve.

So postwar culture is a puzzle - why did such a deliberately distinguished age have achievements of such distinction? One explanation is that the rise of postwar pragmatism in the political, social and economic spheres and the parallel decay of grand ideology in the postwar intellectual world, although sharing some common origins and offering each other mutual reinforcement, were two quite distinct phenomena.

The former grew out of the ashes of ideological exhaustion. It was always streaked by pessimism, a dark memory of just how barbaric the world could become if enthusiasm was not restrained. Because such memory played a decisive part in forming postwar pragmatism, this pragmatism could never be entirely innocent and care-free. It was a retreat to sanity and retreat, never has the same feel as advance. Even in its most hopeful heyday around 1960 it never lost this quality of recession. Kipling in an earlier Imperial heyday may have wondered "when will Nineveh and Tyre". The postwar world did not have to wonder if it had experienced the destruction of many modern Ninevehs and Tyres.

The latter was very different. The intellectual assault on the grand ideologies was not a retreat but an advance. New knowledge and superior explanations were rapidly and inexorably condemning them to the fate of the dinosaurs. In the world of ideas the retreat was with ideologies was not their past horror but their present safety. The retreat ceased to be a retreat for the almost pathetic security of their organization, of ideas

instead they were regarded as tools which scholars and scientists could use to clear a few more square miles of the forest of ignorance. When they came worn out they were sharpened or replaced by superior tools of inquiry.

This new sense of the forward march of knowledge was most keenly felt in the natural sciences and technology. But non-science disciplines were also deeply affected in the 1950s and 1960s. Economics in the high noon of Keynesianism developed into a form of benign social engineering. Under the influence of scholars like Talcott Parsons, David Riesman and Daniel Bell the social sciences adopted a perspective broadly similar to that which guided the development of science and technology. Even the humanities, although touched more deeply by the unheroic and even recessionary spirit of the postwar age, did not remain unaffected by such pragmatic optimism.

Yet the forward march of knowledge after 1945 was very different in spirit and background from that which had animated the Victorians 100 years before. The most important difference was that it was not accompanied by the certain improvement of human society. Faith in the latter could only be regarded as naive in the light of European history between 1914 and 1945. So the intellectual optimism of the postwar years was not rooted in a deeper social optimism. It depended instead on its internal self-confidence which was sustained by a diet of scientific and scholarly "successes".

The self-sufficiency which appeared so admirable in the 1950s had become by the 1970s a much less admirable alienation from some of the key preoccupations of modern society. Yet for almost 30 years after 1945 the new pragmatism that had emerged from the confusion of war sustained an environment in which a new intellectual pragmatism - pluralism perhaps is a better one-word description - was able to flourish. In return that pluralism sustained the legitimacy of the new postwar order. These two may need to be regarded as separate phenomena for some purposes: indeed it is essential to do so. The underlying flaws in postwar pragmatism are to be understood, especially in a discussion of that slippery concept culture.

The most important question that must be asked in this context is really very simple - did postwar culture represent a clean break from the ideological agenda established in the one and a half centuries between 1789 and 1939, or did it simply amount to a resistance to the same ideas and values in more moderate terms, a cleaning-up of the modernist act after the painful excesses of the first half of the twentieth century? The question having been asked in these terms the answer seems obvious enough. The exuberance and excesses of grand ideology may have been discarded but the modern project itself - the national, the industrial/scientific, the democratic, and the revolution of the senses which I tried to describe last week - remained intact.

Some will argue that the first of these revolutions, the national, was substantially recast after 1945 and that we entered a new age of internationalism and interdependence. In Europe maybe - but in the rest of the world? Certainly in western Europe aggressive chauvinistic nationalism seemed to be a spent force. But even here not only did the nation state remain the effective political unit but nationalist sentiment was channelled into new gnosticism, racism and great-power rivalry. Even in the postwar years the western European, not to mention the eastern European, nationalist was retrained by Soviet power but this only produced a volatile alliance between the national and the democratic revolution in those countries.

In the wider world beyond Europe of course the years after 1945 saw the culmination of the national revolution. More nation states were created in the following quarter of a century than at any previous time in history, and most of them unrestrained by any fears about the unqualified exercise of national power which became pathological endemic in Europe. Just as in the nineteenth century the nation state, in its democratic form, was regarded as the best instrument to curb internal privileges, the customary power of courts, nobles and churches, so in the later twentieth century the nation state, sadly not always in a democratic form, came to be regarded as the best defence against external privilege, the economic and political power of the old and advanced nations.

Of course the rise of nationalism in what came to be called the third world was such a blatant phenomenon that it could hardly be ignored by even the most confirmed pragmatist. In *The End of Ideology* published in 1960, a book that almost provided a title for the whole postwar age, Daniel Bell argued that welfare state politics and Keynesian economic management had established a benign consensus in the advanced west and that virulent ideological conflict had been relegated to the decolonized third world. Such a claim may have been generally true, at any rate until the explosion of 1960's counter-culture and the end of the long postwar boom in the mid 1970s. But it is especially revealing of the views of intellectuals. Their reaction against the excesses of nationalism after 1945 was especially marked and the most spectacular intellectual advances, above all in science and technology, seemed quite literally to transcend national frontiers. But far from offering proof of any weakening of the national revolution it may simply point to another gap between academic and lay cultures in the postwar years, a dislocation potentially as significant as the contrast between intellectual optimism and social pessimism discussed earlier.

But even if memories of 1914-45 and the rise of a new internationalist spirit took some of the shine off the national revolution, the postwar years saw an immense reinforcement of the industrial/scientific revolution and its great supporting ideology of positivism. Not only did the spectacular progress of science shake up a wider faith in the inevitability of progress, but the experience of wars, revolution and depression; but it also offered an eloquent metaphor to describe the better organization of human society. This mechanistic and linear metaphor was eagerly seized upon by the social sciences which adopted an increasingly functionalist and technocratic perspective. David Riesman's *The Lonely Crowd*, a decisive work of the 1950s, helped to establish the philosophical foundations for such a perspective, arguing that in the rich and stable west the "inner-directed" society type guided by authority and tradition was being superseded by a more conformist "other-directed" type guided by the pressures of its peers.

The progress of economics offers an illuminating example. The triumph of Keynesianism, in both treasury and academy, meant that the focus switched from mid-to-economic regulation - or deregulation - to macro-economic planning. The economy was no longer regarded as a process subject to inexorable natural laws outside man's command, but as a machine that could be fine-tuned and steered to meet our convenience. In Daniel Bell's *The Coming of Post-Industrial Society* the progress of science and a technocratic vision of society were brought together in an impressive display of positivist futurology.

Not only was the third item on the agenda of modernity, the democratic revolution, with its attendant ideologies rang-

ing from liberalism to socialism, ignored in the postwar period. All the newly founded states adopted its rhetoric if not its substance. None attempted to reassess pre-colonial customary values as a basis for organizing their independent government. It may be argued that the expansion of Communism rule into eastern Europe in the mid-1940s and parts of Asia a few years later was an exception to this rule. However it is difficult to tell this revolution, despite the tyranny it had come to represent in practice, because it too was committed to the organization of society according to abstract and rational principles rather than in harmony with customary tradition.

In the west the rise of welfare-statist marked an intensification of this democratic revolution. Its footprints were everywhere, in the reform programme of Labour Britain between 1945 and 1951, in West Germany's "social market", in the success of New-This and New-That that have littered American politics since 1933. The benign consensus which Bell described and which in Britain came to be called (retrospectively) "Butskellism" was based on the widespread acceptance of a need to extend the agenda of the democratic revolution to include large areas of social life. The popularity of Anthony Crosland's *The Future of Socialism* reflected not the originality but the banality of its thesis of altruistic collectivism.

The revolution of the senses, the final item on the agenda of modernity inherited from the nineteenth century, also accelerated after 1945. In the north Atlantic world at any rate external foci of authority and loyalty became still weaker; organized religion declined further; the grip of the quasi-religious ideologies of prewar years was relaxed; and the power of community custom and tradition eroded. Yet the result was not a golden century in which individual sensuality was given the highest value. Instead popular culture and individual life styles became commodities. Mass manipulation of personal choices became an essential element in the modern economy. The revolt of romanticism in the late-eighteenth century had been to a considerable extent a protest against the inhibition of individuality within pre-modern society. Yet it led, maybe by tortuous routes, to a late twentieth century consumerist society in which individual choices were ruthlessly manipulated in the market of mass culture. Dust to dust in less than two centuries.

Postwar culture, far from representing a clean break with the past, finding a new break with the past, finding, moderately but decisively, the agenda of modernity that had been drawn up in the one and half centuries after 1789. That in a sense was the trouble. Postwar pragmatism was undermined by its success rather than by its failure. It met its objectives and then had nowhere else to go. As Ralf Dahrendorf put it in his essay "The End of the Social-Democratic Consensus?": "The classical social-democratic position has been realized; it is no longer a force for change." Many who remember disappointed hopes of 20 or 30 years ago will instinctively recoil from this statement. But it is difficult to deny that the failures of postwar culture, rather than being the result of flaws within the new pragmatism that grew up after 1945, reflect deeper fissures in the modern project itself. Its very successes exposed most cruelly the intellectual, moral and even personal limitations of modernity. To adopt a sentence of Matthew Arnold, postwar culture failed to relate its undoubted success to our sense of private and public conduct and our private and public beauty - and it fell victim to the weariness and dissatisfaction bred by that failure.

Peter Scott

Next week: The privatization of knowledge

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The Soviet science bureaucracy, 11

Found: Liverpool's ancient man of the turf

by Paul Flather

Scientists and archaeologists from Liverpool University are investigating the remains of a body which could be as old as 1,500 years found almost perfectly preserved in peat just 35 miles east of Liverpool.

Mr Robert Connolly, senior lecturer in physical anthropology in the university anatomy department, was called in by the police and local council officials to identify the man's body after workmen at Lindow Peg Moss came across a human foot complete with toe-nails severed by their peat-cutting equipment.

Mr Connolly is one of the country's leading experts on human remains. He helped identify Tutankhamun's blood group, and investigated a number of pharaohs as a member of Professor

Ronald Harrison's team at Liverpool in the 1960s. He is currently studying skeletons found at Norton Priory in Cheshire.

His Liverpool team investigating the latest find also includes Dr Joan Taylor, head of the prehistoric archaeology department, who helped date the body, and geographers who have taken peat samples. Members of the university's archaeology rescue unit were also on hand.

The find - the first of its kind in mainland Britain - is said to be of major national importance. Mr Connolly plans to provide an exact date and explanation of the body's location. Similar previous finds in Denmark and elsewhere have turned out to have been ritual sacrifices pegged down by a noose round the neck.

It is of particular importance because of the

well-preserved condition of the body, complete with hair, finger-prints, skin, and stomach contents. The bones, however, have decomposed because of the action of acids in the soil. The body, a greyish, pale brown in colour is still instantly recognizable as human.

For Mr Connolly it will be an exciting new challenge. "The investigation will be very different from the pharaohs," he said. The issue is soft and wet-farmed, rather than dry and mummified. It is of enormous importance.

The body is now in the care of the British Museum where it is being preserved at a temperature of four degrees centigrade. It was transported in a block of peat. Radio carbon tests are being carried out, but it is thought to date from the Romano-Britain period, about 400-500 AD.

Research board begs Treasury for extra cash

by Jon Turney, Science Correspondent

The research councils' main chance of securing extra cash in next year's science vote rests on the Treasury's response to a plea for equal treatment with Government departments on pensions and early retirements.

The Advisory Board for the Research Councils, which arms Education Secretary Sir Keith Joseph for his negotiations with the Treasury over science funding, is arguing that the councils lose out because they bear these costs themselves. In other parts of government, such costs are met by the Treasury directly, through the Pensions-General's vote.

Although the ABRC puts up a list of scientific opportunities to back the case for extra cash, the only new money added to the science vote last year was the result of a similar financial argument about rising costs of international subscriptions as currency rates shifted. The Government found an extra £2m for this in 1984/85, and the vote will be hoping for at least this much again.

The research councils argue that this is needed even to maintain level funding. The Government's declared aim for the science vote. Pension costs, paid from their science budget allocations, are rising each year because some staff are retiring faster than new staff are being recruited. The more money we pay in pensions, the less we have for research," one official said. "ABRC estimates that three of the five councils - Agriculture and Food, Science and Engineering, and Natural Environment - need £8.7m over the next three years just for extra superannuation costs. The SERC alone

estimates its payments will rise by £1m a year for the next five years.

The Medical Research Council's position is different as it runs a contributory pension scheme, but it also loses when the employees' contribution is revalued by independent actuaries.

The same argument applies to costs from early retirement or redundancy, also met from the Pensions-General's vote in Government departments. And the research councils' costs again run into millions over the next three years. The ABRC plans to shed 800 staff through restructuring of institutes.

This year's list of scientific opportunities will be virtually identical to last year's, so the arguments over who pays pension and redundancy costs must be regarded as the main new plank in the ABRC's case. The board will also point out that the University Grants Committee received special funding to cover the cost of early retirements forced through after the 1981 cuts.

A recent move to take the costs of research council pensions out of the science vote altogether came to nothing - the Treasury would prefer to institute the research council system in other parts of Government service. That the ABRC is now pressing the point that if the present arrangement is to continue it must be fairly funded. The strength of the argument is that while this is only one factor in erosion of the science budget's real value, it can be quantified. The other influences - decline in university support, rising equipment costs, and the "sophistication factor" which makes research of international standing more expensive each year - are harder to use to sway Treasury views on the meaning of level funding.

Libraries called in to fight VAT on books

by Ngalo Crequer

All university libraries have been asked this week to estimate the effect of a 15 per cent Value Added Tax on books and periodicals because of a growing belief by the book trade that such a tax will be introduced in the next budget.

The request for information has been made by the Standing Conference of National and University Librarians, which is joining publishers, authors and others in a concerted pre-emptive strike against

entertainment? It is now on text books lists.

"We think this policy would net about £80 to £100m which is chicken feed to the Government, but the banana skin potential is enormous," he said.

His said group was first collecting information, including a research programme funded by W.H. Smiths comparing EEC figures, and would then be able to put both the technical and emotional case against.

Also, Mr Julian Blackwell, chairman of Blackwells, has written to 132 learned societies to gauge the effect of such a tax.

This issue will also be raised at a one-day conference planned for mid-January on the state and literature



Chicago goes to the Fringe

Doing the cell-block tango: the National Student Theatre Company razzle-dazzles audiences at Edinburgh's Cathedral Hall in "Chicago" by Fred Ebb and Bob Fosse, one of the company's shows at this year's Edinburgh Fringe. Six of the seven productions, including a review, are new plays being performed for the first time.

SIMON GROSSET

Rush on for places

Universities and polytechnics are rapidly filling their places just a week after the publication of A level results, and competition is tougher than ever.

The matching of university places to Cambridge board in sending results to the Universities Central Council on Admissions, and the effects of a fire in the storeroom at Honeywell, the firm which supplied the new UCCA computer.

Most universities have reported an increase in applications and average UCCA scores have gone up by around one point. Many subjects are already full but there are still places in physics and mathematics at a number of institutions.

Chemistry grades were nationally poor and so places are still available in this and related subjects.

Southampton is unlikely to go into the clearing system in any subject. At Nottingham arts and social sciences will be filled, but they may go into clearing on a limited basis in some other subjects.

At Salford, electro-acoustics, business and administration, chemistry, geography and modern languages are full. There is a handful of places left in all engineering subjects, physics, maths and social sciences.

At Manchester there will be fewer Clearing places than usual, with small continued on page 3

US offer to third world

from Peter David

WASHINGTON

The United States is considering setting up its first scholarship programme to help disadvantaged undergraduate students from developing countries take courses in American universities. A bill establishing a new scholarship fund narrowly failed to become law this month, but is attracting growing support in Congress and will probably be passed by next year.

Its sponsors expect it to enable tens of thousands of overseas students to enter American Universities under United States government sponsorship. There are already about 340,000 foreign students in the country but most pay their own way or receive support from their home governments. The proposed legislation has already been approved by the Senate but failed, largely for procedural reasons, to find its way into a supplementary appropriations bill for the 1985 fiscal year. The bill nevertheless enjoys strong bipartisan support in the House and is almost certain to be approved eventually.

Much of the enthusiasm for the measure is based on concern that the Soviet Union's extensive support for students from developing countries is damaging American political interests. While introducing the bill earlier this year, Senator Charles Mathias of Maryland said that in 1982 some 37,000 American students were trained in the Soviet Union at government expense, compared with only 3,000 in the United States.

At present some 80,000 people around the world take part in educational, cultural and scientific exchanges sponsored by the American government.

Letters to the editor

A common validating body

Sir, - Is there not just a hint of nervousness in the reaction of Professor Harvard-Williams (*THE*, July 27) to the suggestion of a common external validating body for all higher education? Having taught in both the university and public sector during the past 10 years it is clear to me that the burdens of the current Council for National Academic Awards system appear just as excessive to many university staff as do the freedoms enjoyed by the universities to staff in the public sector, in particular in the polytechnics.

There must surely be middle ground retaining those ideals of the conception of the CNA, namely peer review and external validation, and yet allowing "freedom" where it is justified. The experiments being undertaken by the CNA of validation in partnership are exciting and evolutionary and many possible models have been suggested to the Lindop inquiry. The discussion stimulated by this inquiry must be welcomed (and contributed to) by a wide spectrum of opinion within higher education.

The acceptance of a "middle ground" model would provide much needed unification and verifiability together with the consequent advantages of acceptability and transferability: it may even lead to increased cooperation across the binary line. While different funding systems may be justified on the basis of the wider perceived roles for universities and polytechnics, they do share at least one common task, namely that of producing graduates and in this they have common responsibilities not only nationally but also to individual students. These responsibilities cannot simply be discharged at the (final) examination stage.

No one doubts the sincerity of internal examiners but Professor Harvard-Williams goes too far when he implies that external examiners provide all the many facets of their role. Although it must be remembered that most polytechnics have a comparable structure to this, can senates and faculty boards objectively judge the teaching quality of their colleagues, decide whether appropriate and adequate resources are being made available for particular degree programmes, assess whether the type of student produced is what is required by employers, and so on?

If they can so judge, do they take appropriate action if they do not like what they see? Can senates and faculty boards tell the specialists what they should teach? In my own area can they discuss with me the necessary (updating of) technical content of the degree programme in a rapidly developing field like applied statistics?

They can of course discuss with me the statistical content of their degree programmes but I would argue that service to the community and approach is one of the major successes of the CNA. External examining is currently under fire but it should be seen as one link in the external validation chain.

In this department we have just been through the resubmission of our undergraduate programme and many of us felt it to be excessively costly and time-consuming. However it did cause us to take a thorough look at all aspects of the whole programme and we now have indefinite validation under a system which will be cheaper and keep us on our toes. We like to think that without the pressure of external validation we would have kept up-to-date with this programme but as we all know there are many other day-to-day pressures on higher education staff. It is a pity that Professor Harvard-Williams resigned from the CNA board of which he was a member for some of the constructive points he was beginning to make in the final paragraph of his letter would be well made from within the CNA system; it is to be hoped that he has communicated his point of view in the Lindop inquiry.

Yours faithfully,
RAYMOND R. HARRIS,
Department of Mathematics, statistics and computer research,
Sheffield City Polytechnic.

Computer converts be warned

Sir, - The recent publication of the Butler Report has emphasized yet again the shortage of graduates in information technology. Since it is sometimes argued that the 1982 "IT Initiative" of the Department of Education and Science, with its creation and expansion of conversion courses to provide places for an additional 2,000 postgraduate students by 1985/86, will go a long way towards solving the problem, I was interested to read in *University Computing* an article describing the experience of one institution in setting up such a conversion course. I noted the categorical statement that "the course aims in just one calendar year to reach the standards of an honours degree in computer science". If they can really do this the country's problems are solved - at a strike we can triple the output of trained personnel (and those of us who have insisted on teaching three year degrees should be convicted for gross misappropriation of public funds). Certainly, it is possible in a year to

train an arts graduate to do useful work in the IT industry, but can you really claim that this training is equivalent to a three-year undergraduate course? It is a sad reflection on the public perception of computer science that the question should even be asked. The man in the street would not trust his budgeting to a "vet" who had taken a one-year conversion course after a first degree in Anglo-Saxon, but it appears that such a training is adequate for programming missile guidance systems. (Indeed, one company claims to convert arts graduates into real-time programmers in three months. I just hope that my life never depends on one of their programs.)

As a zeroth generation computer scientist (ie I was in the computer business before computer science was invented) I have become convinced that computer science is a subject as difficult, challenging, subtle and intellectually stimulating as physics (my first love), mathematics or any of the sciences. In addition its practitioners

have to be competent engineers, since they are building systems as complicated, if not more so, as anything else that we encounter in normal life. Three years is little enough to convey the essence of such a vast subject to a student - we ought to be pressing for four-year degrees. Conversion courses certainly make a useful contribution in the present desperate situation, but we should not delude ourselves that in this way we are solving the real problem of the lack of fully trained graduates, and we should at least be honest about what we are producing. Eight of the 49 Science and Engineering Council-approved "conversion courses" lead to a diploma, which is perhaps just acceptable. The remaining 41 describe their successful students as *Masters of Science*. There's food for thought.

Yours faithfully,
D. W. BARRON,
Head of department of computer studies,
University of Southampton.

Continuing the debate

Sir, - What a pity that Keith Hampson has joined the Philistines! I had thought better of him. It is not to deny that his expansion should not be the expense of general and liberal education. One is not "self-congratulatory" in arguing that the half of one per cent of the education budget now devoted to the quality of life, concerns with social and political issues, and remedying educational inequalities in earlier life, must continue to have a place in any society claiming to be civilized. That is the lead for which "adult education we are still waiting".

Yours faithfully,
H. D. HUGHES,
Hon. treasurer,
Workers' Educational Association.

Sir, - May I take Keith Hampson's excellent arguments (*Party Line*, August 17) a stage further.

I have long believed that the traditional universities will only take continuing or lifelong education seriously as it should be taken when they accept it as a full, mainstream part of their activities. And this will only happen when the extramural departments are abolished and the principal schools and departments at each university themselves take over the "extramural" activities. To be fully effective, adult education must be integrated within the matrix of a university organization and structure.

Yours sincerely,
PHILIP F. NIND,
The White House,
Abinger Common,
Surrey.

Facing facts

Sir, - Collins and Sharplin's view of science (*THE*, July 27) totally ignores the counter-attack on Kuhn made by Lakatos and other writers of the Popperian school. When Collins and Sharplin say "... how something comes to be seen as true, unambiguous and repeatable is a social process ...", it can only gasp, and remark that, if it were the case, science would surely still be stuck in the inquisition.

There, hypothetical teacher's four aims are all very well, but why have they omitted - what is surely science's primary aim - that of trying to understand puzzling phenomena? Their dislike of a priorism in science seems to lead them to overlook the central role in science of mathematics. One can simply talk mathematics' role in science as a central feature of modern science. Indeed as automation and telemetry take over much of the experimental load, a blend of mathematics and physical intuition is becoming increasingly the central scientific effort.

Let's begin formulating a new view of how to teach science on the basis of what science is which faces up to the facts about what scientists do and how they think.

CHRIS ORMELL,
School of education,
University of East Anglia.

Threat to two art degree courses

by Karen Gold

Two art and design degree courses, at Falmouth School of Art and Bradford and Ilkley College, are on the list of possible closures to be considered by a National Advisory Body group in 10 days' time.

The NAB's art and design consultative period, criticized by colleges and the National Association of Teachers in Further and Higher Education as being too short, ends today.

The art and design group meets on September 5 to consider the future of about 25 courses which, according to the NAB, may be geographically and academically isolated because they are the only art and design courses in their respective institutions.

The NAB asked each institution, local authorities and regional advisory councils for an opinion on closing the courses, or alternatively on expanding them into centres for art and design.

The exercise was originally thought to be limited to DATEC courses. But at least four degree courses have been included: at Liverpool and Plymouth polytechnics and at Bradford and Ilkley. The two polytechnic courses have now been excluded from the Council for National Academic Awards, and Plymouth because the group has decided the course's future lies with the polytechnic or the Cornwall College, which was also included on the original list, has also been re-privatized.

Falmouth is in the unique position of facing being closed down completely if the BA fine art degree, which accounts for 130 students out of a total of 230, is closed. The college and its governors have launched a campaign, with politicians, eminent artists and alumni being asked to protest to Sir Keith Joseph, the Secretary of State for Education and Science.

Acting principal Mr Ian Carrick said the college was neither geographically nor academically isolated: the Cornish environment was very important to Falmouth students in addition to the artistic tradition of the area, while more than 20 per cent of students went on to other colleges, many in London, to do postgraduate work.

Falmouth seemed to be a scapegoat after other degree courses had been re-privatized. "The NAB feels it must close at least one degree course in fine art in order to show the preference for design courses required by the Government," he said.

Bradford and Ilkley has also opposed closure, with the backing of Bradford education authority, saying that its general art and design degree course is supported by non-advanced work in the way the NAB recommends, and its other advanced work proves it is not academically isolated.

A DIPHE course at Ardingly College, which was also included on the original list, has also been re-privatized.

Commons debate date fixed

The Government will give its preliminary views on the long-term strategies of both the University Grants Committee and the National Advisory Body in a Commons debate on higher education when Parliament returns in the autumn.

It is also expected to comment on the latest forecast for student numbers up to the 1990s, which are higher than those used in planning until now.

The debate on October 26 is a result of a long-running campaign by the Government and the House of Commons to lobby the MFs, according to Mr Bennett. "The debate will be on adjournment, so there will be no vote."

Election plea turned down by Younger

The Secretary of State for Scotland has flatly squashed requests that the chairman of a new body overseeing business and technical education should be elected.

Mr George Younger has announced that he will appoint the chairman of SCOTVEC, the Scottish Vocational Education Council, which will be formed later this year through the merger of the Scottish Technical and Business Education Councils.

Chairmen of both SCOTVEC and SCOTBEC are elected, and the council asked Mr Younger to allow the process to continue, going to the length of repeating their request when it was initially turned down.

A letter from the Scottish Education Department says ministers felt that SCOTVEC would be operating in markedly different circumstances to either SCOTVEC or SCOTBEC, and this to the Government appointment of the chairman.

Mr Andrew Moore, chief officer of SCOTVEC, said SCOTVEC would face a difficult financial climate and changing educational patterns, but added: "Whether that justifies the appointment of a chairman is another matter."

The two councils would probably merge in line with the decision, since they were in line with the government policy in setting up any other quango. "Some members had made it very clear that there were certain people they would not find acceptable as chairmen."

The final group would well erupt when the government announces who it has chosen. Mr Moore said: "Whether an elected chairman was any more or less acceptable than an appointed one depended on the individual he added."



Competition for student places tougher than ever

continued from front page

numbers in some engineering courses, French, physics, science and technology policy, geography, arts combined studies and Middle Eastern studies.

"But we have had to turn away a lot of excellent candidates who have got the point count, but not the exact grades," an official said.

An official at Dundee, which reports a 5 per cent increase in applications, said: "It's a tragedy to be turning away people who could certainly cope with the courses and would have been sure of places just a few years ago."

Still, a university said there was much more competition for vocational courses, for example accountancy and pharmacy. There were 2,500 applicants for 250 places on the business school's BA courses.

At Liverpool acceptances have been greater than expected, and good candidates have had to be turned away in English, modern history, and com-

Victoria and Albert amuses most

by Patricia Santinelli

More students visit the Victoria and Albert Museum or the National Railway Museum in York, according to a new survey by the Office of Population, Censuses and Surveys.

The study was carried out by Mr Patrick Heady on behalf of the Office of Arts and Libraries between 1979 and 1980. It shows that the V&A's visitors comprised 17 per cent of students compared to 9 per cent at the Science Museum and 2 per cent at the Railway Museum.

Around 40 per cent of the students who visited the V&A had specialized in some kind of visual art and only 15 per cent in a scientific subject. For the Science Museum the proportion was 8

per cent in visual arts, and 57 per cent in science.

The survey was designed to provide information for staff responsible for design and organization at the three museums and it was based on two separate samples involving between 500 and 1,000 visitors.

It shows that visits by about half the visual arts students to the Victoria and Albert had some kind of educational link and the same appears to be true in the case of science students' visits to the Science Museum.

In the case of students visiting alone or in informal groups, 17 per cent of visual art students visiting the V&A and 18 per cent of science students at the Science Museum indicated the main reason for their visit was their studies.

The study also shows that the V&A had the most highly-educated visitors. More than half had completed their education beyond their twenty-first birthday, compared to 39 per cent at the Science Museum and 17 per cent at the Railway Museum.

In addition, visitors to the two London museums appeared to have a higher level of education compared to the British population generally. Some 45 per cent of the V&A visitors and some 34 per cent at the Science Museum had continued education beyond 21, compared with the 10 per cent which would be expected if the visitors were "typical" of the whole population.

Visiting Museums, by Patrick Heady, is available from HMSO £13.



Public sector negotiators were poised to meet local authority representatives at the Advisory Conciliation and Arbitration Service this week over their disputed pay claim. The team (left to right) were Mr John Lever, of the Association of Principals of Colleges; Mr David Triesman, negotiating secretary of the National Association of Teachers in Further and Higher Education; Mr Peter Dawson, Natfhe general secretary; and Mr Ray Grace, Natfhe executive member.

Merger colleges want extra £15m for single London site

The University Grants Committee should find an extra £15m to secure a single site for London University's three-way merger between King's, Queen Elizabeth and Chelsea colleges.

This is the main conclusion of a site planning review drawn up by the colleges and submitted to the university court. The colleges argue that buying Somerset House and Cornwall House, government buildings near King's College in the Strand, will save money in the long run.

They also say that multi-site operation would be academically disastrous, and prevent sales of some college-owned buildings.

The university sympathizes with the report's case for capital funding from the UGC, but has warned the colleges that the committee is likely to insist on close examination of the lowest cost option, even if it means a split campus. The formal merger is due by the 1985/86 academic year, so approval for

new buildings would be needed quickly.

The colleges would like to use Cornwall House, described as "unprepossessing but practical" for science teaching, taking over space occupied by the Laboratory of the Government Chemist. Somerset House would make up the total space needed to the normal UGC allocation.

They report estimates that the buildings would cost £30 to £40m, offset by £10m from sales elsewhere. Keeping multiple sites would cost £8m for removal and adaptations and an extra £1.5m a year in running expenses.

The court of the university has already rejected a bid from the colleges for extra funds to help merge the separate college libraries. The three college principals have protested that the decision takes no account of the urgent needs to bring the three libraries' cataloguing and classification systems together. The court is now reconsidering their proposal.

Since 1970 when the BBC joined forces with the newly-formed Open University, through the Department of Education and Science, it has made all the programmes which have made it a unique university of the airwaves.

A move towards supplementing the BBC's income with training packages would be a major departure, but this would need the approval of the corporation's governors.

It would involve a redrawing of the agreement with the DES. As the paymaster it directs the BBC's grant through the OU and the proposed 13 per cent cut over three years imposed upon the university has triggered off the crisis.

The search for new partners, Miss Innes stressed, had nothing to do with the quality of the OU courses and material. She said these were excellent and it was envisaged that the relationship with the continuing education department in particular could still develop.

Personal file, page 5

ma courses in accounting, engineering and librarianship.

At Bristol most of the general arts courses were almost full and only candidates with seven or more points were being considered. But science, engineering and new technology courses were still looking for applicants, as were BSc nursing and building courses.

Manchester Polytechnic is at least half full, with over 200 inquiries coming in every day. On average its faculties ask for a six point minimum. Science courses there are recruiting as fast as the arts, and courses are declaring they are full earlier than in previous years.

But at Preston Polytechnic, the only course still making offers is the degree in mechanical engineering. At Leeds, where director Dr Patrick Nutgens was helping out in the admissions office, there were still some vacancies in degree and higher diploma courses in accounting, engineering and librarianship.

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DON'S DIARY

SUNDAY

Moscow: I breakfast in the fifth floor buffet of the Academy of Sciences Hotel on Leninsky Prospekt. This is a place familiar to many academic visitors to the USSR and well-known for the speed of its service. My nervousness about tonight's flight to Yakutsk in Siberia increases.

I would be less worried if anyone whom I haven't met in Moscow during the last week had much idea about the flight time, the population, the weather.

Lena, my Moscow guide, surprises me by saying that I must negotiate the problems at Domodedovo airport myself - I know 20 words in Russian (all for politeness or food). The tourist lounge is for "tourists"; no one speaks English and the flights shown on the departure board are for Erevan, Novosibirsk, Baku and Yakutsk: not Yakutsk. I discover that I am the only foreigner on this flight and that such visits are so rare that they don't bother to list Yakutsk in Latin letters.

MONDAY

Yakutsk: The flight to Yakutsk has taken six and a half hours but I could not sleep. My two contacts meet me at the airport, where it is snowing and is -5°C, actually coming into the plane together with Luba who is to act as interpreter throughout my visit. She speaks clear English but I am the first native English speaker she has met and she is very nervous. I'm taken to the Lena Hotel (named after the famous Siberian river); the room is similar to the one in the Academy of Sciences Hotel but the plumbing is primitive. Plumbing and sanitation are serious problems here because of the climate (-65°C to +35°C) and the permafrost and I am apprehensive when I learn that I will spend most of my time out at the cosmic ray field station 50km away; they are very concerned about my comfort there.

TUESDAY

My hosts have made every effort to make me comfortable and succeeded wonderfully. My only concern is access to the earth closet toilet which is via wooden duckboards spanning rough ground and many small ice ponds. On my first visit I slip from one of these and find that even at -10°C there is sufficient water below the ice to wet my feet. I spend an exciting morning visiting the various detector systems which cover an area of 18 square kilometres. This is 50 per cent larger than our own detector array at Haverah Park, near Leeds, and it is easy to understand and appreciate their achievement - in successfully constructing and operating such a device in so adverse a climate. There are clearly no problems with planning authorities! By any standards the look of the site is ugly but the beauty is to be found in the detector systems.

One purpose of my visit is to try to discover why the intensities of the highest energy cosmic rays measured at Yakutsk and at Haverah Park differ by almost an order of magnitude. To help in this my hosts have produced a preliminary catalogue of their highest energy events which they present to me just before dinner.

WEDNESDAY

It snowed again through the night and is very cold. April is springtime in Yakutsk which seems to mean that the weather is changeable but usually above -5°C through the day. The sky is often cloudy, which comes as a surprise as the detection of Cerenkov light from the air is a major scientific activity here. The working day starts with a vigorous seminar by one of my hosts. I have met him at many conferences and know as a brilliant and confident lecturer in English. In

Russian he seems formidable although he is said to speak it poorly and uses his native Yakutian with his family. Soviet seminars normally last for two hours but the need for translation extends this time considerably. Not only are there differences between the Yakutsk and Haverah Park measurements but it turns out that there are strong and deep divergences between the Yakutian "neighbour" groups on the interpretation of their own data! This makes for a lively triangular discussion and I have to be unusually diplomatic.

By lunchtime we are exhausted but after a short break start again to discuss the Yakutsk/Haverah Park differences. They find it impossible to fault our most convincing data and are reluctant to admit that there can be any fault in their systems which might cause them to mismeasure or to lose big events. The very large areas of agreement between the two data sets at lower energies are very reassuring but I find it hard to accept their proposal that they have just been unlucky, statistically, in failing to record any events as energetic as we claim.

THURSDAY

We spend the morning and much of the afternoon discussing some very technical points which may relate to the Yakutsk/Haverah Park paradox. To my surprise I find that photographic evidence to support our views which I had given to one of the group leaders eighteen months before had not been passed to the electronics. The latter looks at this evidence somewhat agitated and I feel great sympathy for him.

In the afternoon physics is forgotten as we set off for a mountain walk. The Yakutsk group are building a new station about 4km away and 500metres up a mountainside. My clothes, suitable for an English winter, are deemed inadequate for this expedition so I am supplied with proper winter wear. On the walk to the new station we pass through a forest of silver birch - the *taiga* - and spot three elk about 300 metres away. We walk for two kilometres and when we reach the site of the station I find that an advance party have prepared an elaborate barbecue for about 30 people. The reindeer *shashlik*s are magnificent and warmed by these and much vodka I do not notice the cold.

After we came back from the mountain a small group of us continue in my room until the early hours. The 2 am walk to the toilet is particularly interesting.

FRIDAY

The morning after it is my turn to represent to a large audience augmented by a number of people who have driven from Yakutsk for the occasion and by the wife of one of the engineers on the array who asked last night if she could come. She is an English teacher in the local village school (18 hours per week to classes of 14) and wishes to hear the real thing.

She sits, distractingly lovely, in the front row. My interpreter clearly resents having to share the only native English speaker she has met and becomes quite irritated when Natasha helps out with some translations which she finds tricky. During the afternoon the wind gets up - only a breeze by English standards - but apparently very unusual here. It begins to snow heavily and just as we are about to start our "last night" party, the power fails. It turns out that two of the poles carrying the main power line have come down across a road. Many of the poles are at large angles to the vertical and I surmise that it is hard to drive them deep enough into the permafrost so that they stay vertical when spring comes. They are clearly concerned lest I think this a common occurrence (which would play havoc with their running) so I reassure them by telling of how much data we lost during the 1974 miners' strike for similar reasons. Tomorrow is *subbotnik* when, to mark Lenin's birthday, Russians work for nothing, usually at jobs having lower status than their normal occupations ironically. I am in luck as the group's task has been planned as the group's task.

Alan Watson

The author is reader in particle cosmology at the University of Leeds.



Some of the 250 students, 100 more than last year, at Middlesex Polytechnic's second annual summer school. This year the school attracted a considerable number of Middlesex's own students, who use the courses - costing around £75 - to repeat ones they have failed during the year, or cover extra material before transferring from DipHE to degree. Part-time students can even speed up their

diploma or degree by gaining summer credits. The numbers are likely to increase again next year, after the start of Middlesex's new modular degree this autumn, which will make adding on a unit in the summer easier for full-time degree students. Students from other polytechnics with modular degrees - such as Oxford and City - can also gain credits from the courses.

MSC denies secret talks with councils

by Patricia Santinelli

The Manpower Services Commission denied this week that it was attempting to subvert chief education officers by starting "backdoor" negotiations on the White Paper *Training for Jobs*.

The denial follows allegations by Mrs Nicky Harrison, chairman of the Association of Metropolitan Authorities' education committee that several member authorities had been approached by MSC regional directors. This had not been to tell them their indicative allocations was an attempt to negotiate over the White Paper.

In a letter to Mrs Harrison which has been circulated to the Association of County Councils and the Welsh joint education committee, Mr Geoffrey Holland, the MSC director says there is absolutely no question of trying to negotiate with individual authorities on work related to non-advanced further education, and still less of subverting them.

"The commission has not yet taken any position on this issue. I personally briefed our regional directors following their last meeting. I stressed that the approaches were to give information and not to start negotiations. So far as I can ascertain those instructions are being followed Mr Holland says.

He adds that regional directors are seeking to talk to local authority officers rather than deal at arms' length with them.

Mr Holland stresses that there is no danger of the MSC misconstruing any

meeting or discussion that might take place but that time is running short for planning for 1985/86.

"It did not seem to the commission that it was in anyone's interest, least of all the students who will be wanting to take non-advanced further education courses, if the commission and its officers sat on such a vital piece of information."

An AMA official said this week however that they were still getting reports from authorities that MSC regional directors were going beyond indicating their allocations and seeking negotiations.

Under the MSC allocation system some authorities will be getting significantly more than under the present system, and others correspondingly less.

The MSC intends to pay authorities a sum reflecting the actual number of students attending their colleges, regardless of where they live. It has taken the total number of student full time equivalents at each college and compared this with the grant related to each local authority which takes into account the students attending colleges outside their own counties.

The MSC denies that such a system might create havoc in the local authorities and their colleges and points out that the actual amount of money is small and the proportion of its control limited at 8 per cent for 1984/85. It stresses that it already funds 13 per cent of NAFE via YTS.

EEC backs paperless journal

by Jon Turney

Science Correspondent

The era of the paperless journal came closer last week with an announcement from the Commission of the European Communities of support for a £9m project to expand electronic publishing.

The commission will collaborate with publishers, software houses, and manufacturers in 10 experimental ventures in new information handling techniques. British participants will include the Royal Society of Chemistry, which will put existing chemical journals "on-line" for computer access.

A separate project will be run by the Oxford firm Learned Information, which will set up an electronic journal, written, edited and distributed on computer. This will be one of four paperless journals created for the EEC scheme.

These will be similar to the Blend project run from Loughborough University, which has been investigating how collectors and readers use electronic systems.

The EEC project aims to strengthen Europe's commercial position in the specialist information market, especially in science and technology. The commission estimates two million papers are published in Europe each year in scientific, technical, medical and social science journals.

The different projects will explore ways of improving access to this information, by electronic document transfer, and reducing delays in publication, by creating paperless journals.

A separate experiment, run from Ireland, will link higher education institutions in Ireland, France and Britain in an electronic "invisible college".

Plea to save Scottish youth training unit

Scottish lecturers and teachers involved in youth education and training will be left without adequate support if the Scottish Education Department withdraws funding from a unique specialist advisory unit.

This warning comes from the advisory committee of SCOVO, the Scottish Vocational Preparation Unit, whose annual £100,000 funding from the SED is not to be renewed.

Ten members of the committee, who are practitioners in vocational preparation and represent the regional authorities, have written to the SED pointing out that SCOVO "has run staff development, held conferences, produced publications, trained trainees, provided consultancy and advice, all from an independent point of view and all with a single common focus".

The letter disputes the SED's argument that the mainstream of education and training should now take on SCOVO's responsibilities. "Our experience is that much of this mainstream is not ready to take on these responsibilities and the rest does not have the time and resources," the committee says.

It also regrets the lack of withdrawal of funds was announced.

Japanese studies boosted

Japanese studies will be boosted at Cambridge, in line with growing academic interest in the subject, after the British Embassy in Tokyo announced to secure a benefaction of more than two million yen (£250,000) for the university.

Cambridge academics had felt for several years that it was lagging behind many European and American universities because it was unable to develop this growing subject area - not least because of increasing ties between the UK and Japan.

They were also worried that the pay in modern Japanese studies was undermining the university's undoubted strength in classical Japanese, western studies in Chinese teaching and research as the two areas have strong academic links, and leaving its Japanese library collection, said to be the largest in western Europe, underused.

The donation from Keidanren, the Federation of Economic Organizations in Japan, now means Cambridge will set up and fill a new chair in modern Japanese studies as soon as possible.

Dr Ian Nicol, secretary-general for the university, said the development of Japanese would bring a better balance to Oriental studies at Cambridge. "We were concerned about the isolation of Chinese and classical Japanese studies. Our programme was lopsided."

Cambridge will make up some ground on Oxford, where the Nissen Institute of Modern Japanese Studies was opened in 1981 in north Oxford following a £1.5m grant from the grant. This followed the creation of a new chair, held by Professor Akihiko Stockwin, two lectureships and one language instructor's post.

The number of undergraduates in Japanese studies at Oxford has gone up to ten a year, and options in Japanese are available in modern history and the politics, philosophy and economics courses. From this autumn Japanese are available in modern history with undergraduates spending the first year at Sheffield University learning the language.

Apart from Oxford, Cambridge and Sheffield, Japanese is also offered at the School of African and Oriental Studies, London, with options in language courses at Aston, Edinburgh, Exeter, Stirling - and Essex. A centre has been set up in Essex.

Professor Jean Blondel at Essex's department of modern languages has been appointed to head a new centre of contemporary Japanese studies, which will run seminars and promote research into all aspects of Japanese society.

Women unruffled by scores

by Paul Flather

The three remaining all-women colleges at Oxford University are unlikely to be panicked into any quick reforms despite their poor showing in the this year's Northern Hemisphere league table of final examination results.

The table, calculated by awarding three points for a first, two for a second, and one for a third class degree, has St Hugh's College bottom of the 28 colleges, St Hilda's second to last, and Somerville in twenty-first place.

Miss Daphne Park, principal of Somerville said that college tutors though obviously preferring a higher rating would not be too concerned by the table. "Colleges shoot up and down all the time and the variations are really very small," she said.

But the results do add to the pressure to review their single-sex status. They already attract far fewer first-class honours per place than the other colleges which have now gone mixed, and they still face hardship in paying for some tutorial fellows, particularly in science subjects.

Admissions tutors deny that the colleges admit second-best students when drawing from the pool of applicants, but they do have two applicants to each place against a university average of three to one.

Paying for fellowships, however, remains the main headache. Usually they are joint appointments paid for by college and university. But the university has to open all posts to males and females to meet the Sex Discrimination Act. If a man is chosen St Hilda's and Somerville must refuse the applicant and find the £400,000 or so to pay for a new fellow over the years from other sources.

St Hilda's recently endowed a physics fellowship after finding funds from Hongkong, while Somerville is facing the prospect of raising money for new posts. Problems arise because women applicants are often less mobile.

Miss Margaret Rayner, vice-principal of St Hilda's said the issue of gender was discussed from time to time but no immediate plans to reopen the issue were afoot. It is also raised from time to time at Somerville.

In the past bright girls only had a few Oxford colleges to aim at and we had a superstitious crack at getting the best," Miss Park said. "Now this is a great move thinly it is bound to have an effect."

One, the only male single-sex college, which will admit women from next year, is ninth in the table, a significant jump from recent years partly because of its new policy of accepting more students from state schools on conditional and matriculation offers.

At Cambridge single sex colleges have also fared poorly in the equivalent table produced by Mr Peter Tompkins, Newnham and New Hall, the two all-women's colleges came nineteenth and twentieth, and Magdalene, the only all-male college, came bottom of 24 colleges listed.

Defence ministry continues with YTS

The Ministry of Defence denied this week any intention of closing down its Youth Training Scheme after claims by Youthlink that the scheme had been a complete failure.

Youthlink, the independent youth employment charity, had said that the scheme which started last year, amid some opposition, had filled only 200 out of a target of 5,200 places. Moreover, 2,000 young people, or one in five, had been rejected for not meeting standards.

But the MoD said that of 4,500 youngsters who applied for the Armed Services YTS between August 1983 and June of this year, some 1,050 had been accepted and some 750 were or had been in training.

The spokesman recognized that this was a 45 per cent shortfall but said it would not lead to the closure of the scheme.

He pointed out that the shortfall was not only young people who had not met the Armed Services' standards, but also those who had not met the standards of the YTS.

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Auntie provides more entertainment

by Felicity Jones

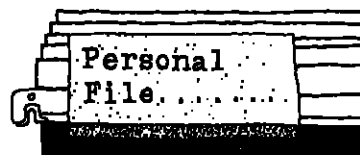
Education programmes on radio and television should not be seen as so different from the rest but more like further entertainment. So thinks Sheila Innes who has just taken over as the BBC's controller of educational broadcasting.

A Lady Margaret Hall-educated linguist, about whom few people have a harsh word to say, she is proud of the kind of educational broadcasting which put Jimmy Savile regularly in front of an eight million strong family television audience to "teach" them about accident prevention.

It was in her mind a breakthrough which proved once and for all that Auntie's education service was not the "poor relation" to the rest of the output.

Another short 10-minute tempter on spoken French is to be fitted into the same slot with a further multi-media course as a follow-up to an optional achievement test and a bursary negotiated through the French embassy for those students who want to visit the country to sample the real thing.

"It is all about engaging the attention of unmotivated adults who may have been put off in the past," she says. "I think it is important with the levels



of unemployment and with the greater leisure time available that we provide a way for people to make creative use of that time which may involve a move away from the traditional academic approach."

To this end another new series will be taking an overview at the sorts of training schemes - the community programme, the technical and vocational education initiative - which are available to adults.

As controller, Miss Innes has what she describes as "a very broad parish" with responsibility for five departments: school radio and television, continuing education radio and television and the Open University production centre accounting for 270 hours of television and 420 hours of radio.

Her experience over 31 years has given her an insider's knowledge of all the media. Starting out as a studio manager, she quickly followed a period as a radio producer when she acted as the British stringer for a



Sheila Innes: has broad parish

French-speaking Canadian current affairs programme.

At one point she was tempted to move into the glamorous side of commenting when she covered the changing of the guard and VIP occasions. "They wanted to have women in reserve in case of a royal wedding," she recalls. But she opted instead for the backroom to work on Playschool and afternoon programmes like Better Photography.

When the further education department was formed she went on to become an executive producer in languages and leisure and became head of

the department of continuing education in 1977. She was the first woman teaching director of the Basic seminar of young European producers.

With her appointment uniquely all three television headships for schools, continuing education and the OU have fallen vacant which could mean a springclean is round the corner. There will be, apart from the search for other business partners, an internal review of programmes at the OU.

The lucrative development of software is another area - with £7m earned through the computer literacy programme already under its belt - in which the BBC could be about to make an aggressive sales pitch. "The BBC must be in the forefront of technological development," said Miss Innes, citing the example of its trials with interactive video discs.

Better coordination between radio and television of the kind already achieved in languages is also on the cards. She sees no reason why universities and schools cannot make use of the same material within certain obvious limits. "There is a wealth of programme material already there that people do not know about of which teachers at different levels could make more use."

The State Mill centre is to be used for the Youth Training Scheme, adult training and an Open Tech site, all projects funded by the Manpower Services Commission and run by the education authority as its agent.

Trainers at the centre are provided by local education colleges and retain nationally agreed terms and conditions. But five Open Tech posts which cover the 50 weeks a year the centre is to stay open are to have different, locally negotiated terms.

One of the posts has already been filled. The other four are currently being advertised, and Naffie has blacklisted them. The union is considering further action when the Rochdale college reopens in September, but is meanwhile seeking a meeting with Rochdale councillors and national union officials.

According to a Naffie spokesman: "The Rochdale authority did not consult us; did not negotiate on the terms and conditions of employment; has cancelled two meetings called to discuss the dispute; has now gone ahead with making one appointment and publicly advertising four others."

Mr Peter Blackmore, Rochdale's deputy chief education officer, said that the appointment of Open Tech staff was being done through the authority's education service. Some of the staff would be programme designers and counsellors, and could come from industry, public service or education.

"This is a new doctrine, which Members of Parliament and others will no doubt wish to have discussed."

Info centre seeks new backers

A national information centre for computer-assisted learning is seeking new backing to continue after existing sponsors pull out later this year.

The Computer Board for Universities and Research Councils has agreed to subscribe to the CEDAR service, based at Imperial College, London, if it can be relaunched as an information association. But the CEDAR administrators are waiting to see what response they have from other potential users before they take the idea further.

CEDAR - Computers in Education as a Resource - was set up six years ago at Imperial, and grew into a national service answering inquiries on computer-based learning, with backing from the Manpower Services Commission, the Computer Board, the Council for Educational Technology and the Microelectronics Development Programme.

This money dries up this autumn, and the CEDAR workers hope the service can continue as an information association. "They want subscribers," said one of the CEDAR staff.

The CEDAR staff hope to reach a similar group membership agreement with the Council of Polytechnic Libraries and with further education colleges. If not, they estimate that individual institutions will have to pay 6,965 each a year for the service.

Rochdale jobs boycotted

Lecturers' union the National Association of Teachers in Further and Higher Education has declared a national dispute with Rochdale education authority, and is boycotting posts in a newly converted mill and training centre there.

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New TUC college redresses balance

by Paul Flather

A £3.5m residential education college was opened in north London this week by the TUC as part of its plan to boost trade union studies over the coming years and match the growing expansion in management and business studies.

The TUC believes trade union courses are needed more than ever given the current level of rapid industrial change and it claims a significant imbalance in the private and public backing given to management education as opposed to trade union education.

The college, which expects to put on courses for 2,400 trade unionists a year, was formally opened by Mr Ray Buckton, chairman of the TUC general council, and Mr Clive Jenkins, chairman of the education committee. It has secure historical roots as it is based in the former Hornsey College of Art, where the Grand Affair of 1968 triggered off a wave of student occupations, protests and unrest.

The college, originally opened in 1931, has had a £1.5m refurbishment. Rooms fronting busy Crouch End Hill have been treble glazed and a creche and children's play area, new parquet floors, studios and Fuller's ale have been installed.

When the idea was first floated in 1976 the TUC had high hopes of some Government backing. After the

change of government in 1979 it had to raise all the funds itself through a 2½p increase in affiliation fees for the country's 10 million trade unionists.

The college will cater mainly for full-time union officials, but it plans to increase courses for women officials and young trade unionists, and to develop its third world programme with the Commonwealth TUC. Typical courses, which will cost £110 a week if a union hires facilities and provides its own instruction, will cover communication skills, how to handle the media, and new technology.

Mr Roy Jackson, secretary of the TUC education department, which now moves to the new college, said new legislation, new technology, and new developing management techniques made it vital to expand trade union studies. Currently the TUC puts more than 30,000 people through courses a year, with unions training another 30,000 a year.

"More than ever we need to find some measure of agreement with industry over the future and if we want unions to do that we must invest in their competence," he said. At present the TUC receives an annual grant of about £1.7m under the 1964 Industrial Training Act. Some 200 centres, mainly colleges, run courses. Meanwhile the Economic and Social Research Council spent more than £1.5m on management and industrial bursaries last year.

Government has failed to improve YTS, says union

Trade unions in higher education are responsible for a series of amendments on working conditions, public spending and the activities of the Manpower Services Commission in the final agenda for this year's Trade Union Congress.

The most far-reaching amendment comes from the National and Local Government Officers' Association, which calls on the TUC general council to consult all affiliated unions with a view to withdrawing support from the Youth Training Scheme from next March.

Its amendment is to a motion tabled by the National Association of Teachers in Further and Higher Education, which praises the MSC for refusing to implement the Government White Paper which would give the commission a quarter of local authority non-advanced further education.

The Nalga amendment deplores the failure of the White Paper to deal with criticisms of the YTS, which it says stem primarily from inadequate funding and low level of allowances to young people of the scheme.

The amendment continues: "Congress notes that the TUC has been unsuccessful in obtaining most of the

improvements in YTS called for at the 1983 congress and that there have in fact been further developments of a retrograde nature".

Two motions proposed by the Association of University Teachers in the original agenda are amended by other unions. The AUT's call for the TUC general council to resist "the Government's attack on academic freedom... and conditions of employment in universities", which included a reference to political pressure on the Open University, is strengthened by a proposed amendment by the Transport Salaried Staffs' Association.

This claims that the Government's interference in asking for OU course changes was a "dogmatic determination to further weaken universities' defence against direct political involvement".

The AUT's second motion on the deterioration in public sector pay is followed by proposed amendments from both the National Union of Teachers and the Society of Civil and Public Servants. The strongly-worded NUT amendment calls on the TUC to reject Government interference in collective bargaining.

The amendment continues: "Congress notes that the TUC has been unsuccessful in obtaining most of the



Three wise walkers: students (left to right) Gordon Aikenhead, from Surrey University, Phil Griffiths, Pontypool Technical College, and Martin Lindsay, Brunel University, after completing a 40-mile walk each carrying 40lb packs, in aid of the Association for Spina Bifida and Hydrocephalus.

The walk across the Brecon Beacons by 250 people raised £10,000 for the association, and was completed by the winning team (who ran it) in seven hours. The students, celebrating with champagne afterwards, took between 14 and 16 hours.

Counselling service goes on Prestel

The Educational Counselling and Credit Transfer Information Service based at Milton Keynes plans to be available on Prestel Gateway by early next year.

By this method users will be able to dial a local telephone number and key straight into the Open University computer to search for information on courses directly.

A program has been devised and is due its first field test with the Plymouth careers service. Users with Prestel can now dial 21161 and make inquiries on the databank which will be replied to

by letter but not yet electronically.

Half way through its Department of Education and Science-sponsored three-year project, ECTIS has had 16,000 personal inquiries, mostly about the first degree and full-time course sector. Inquiries about part-time courses have amounted to about a third.

It has 21,000 courses records on computer file and a further 1,500 are currently being added. There are however only 2,000 non-advanced

courses at present available for the south-west of the country and the same number of items of information on credit transfer held manually.

People can write in, telephone and use the Prestel frozen frame at the moment but by early next year no further modes will be available. The will include microfiche which is being field-tested by the careers services in Sheffield and Weston-super-Mare and is about to be tested in a Plymouth further education college and Leeds public library.

Labour and unions pledge support for MSC

by Patricia Santinelli

The Manpower Services Commission was assured publicly last week that it would have a central role in training under a Labour government.

This commitment was made by both the TUC and Labour Party when they launched a £6 billion Plan for Training document, outlining their intentions to provide young people and adults with skills needed in the future, particularly in the science and technological fields.

The TUC is believed to have pressed for this public commitment, in spite of the reluctance of Labour members on the liaison committee which prepared the document.

Under the plan, which will be presented to the Trade Union Congress next month, all 16 to 17-year-olds would be guaranteed two years of

education, training and work experience through a variety of ways; this would be backed by placing a statutory duty on all employers to train young people.

The scheme, which would be supported by open access to full-time and part-time higher and further education from the age of 18, would be voluntary and trainees would receive a £34 weekly allowance.

Mr Neil Kinnock, the Labour Party leader, said the scheme was fundamentally different from the Youth Training Scheme because it would offer two years of education and training sufficiently prolonged to enable young people to acquire worthwhile qualifications.

Mr Bill Keys, chairman of the TUC employment committee, said the YTS was not working as intended because the government had cut back on

resources to the MSC and to the scheme. This was affecting the quality of the programme and monitoring of the YTS was not being carried out as should be. Recently the area manpower boards had made the same point.

The other main features of the Plan for Training are:

- technical education for all 14 to 15-year-olds;
- a wage of £25 a week for all those who stay at school or follow full-time college courses;
- a five-fold increase in the MSC work preparation and training programmes for unemployed adults;
- a right to paid educational leave and assisted leave for adults in work;
- expansion of adult training and the removal of barriers to entry;
- increasing funding for local authorities.

'Breadline' worry as Irish fees rise

from John Walshe

DUBLIN Some students are cutting their expenditure on food to a "dangerous" level because of high tuition fees, according to the Higher Education Authority in Ireland.

It says that the level of increases in the past four years has caused college authorities grave concern about the effect on students and their families in meeting such fees.

In a confidential memorandum to the education minister Mrs Gemma Hussey, the authority says that governing bodies are experiencing increasing resistance to the escalation of the levels.

Current fees represent 20 per cent of institutions' income, which they feel is as high as can be sustained without improvements in income levels and levels of attainment required to become eligible for grants.

This autumn fees will increase by a further 20 per cent, bringing many course fees over the IRE1,000 (£800) mark for the first time.

The memo from the authority, which has funding and advisory functions, also outlines the effects of current spending policies on equipment, academic development, libraries, maintenance of premises and frozen posts.

It says that new equipment is required to replace obsolete equipment on existing courses and to provide for new courses. It is also needed to augment existing equipment so that new techniques can be taught.

The five university colleges are being hit by a public sector jobs embargo which allows for the filling of only one vacancy in three. Equally serious staff shortages have arisen in the newer national institutes for higher education in Dublin and Limerick because they have failed to obtain ministerial sanction for the creation of new posts which the authority has recommended, says the memo.

"If present trends are allowed to continue institutions will rapidly arrive at a very run-down state which will be altogether more costly to put right," the authority adds.

Costs beginning to slow, says US survey

from Peter David

WASHINGTON The cost of going to university in the United States, which has been rising by more than 10 per cent annually for three years, has finally begun to moderate, according to a survey released last week by the College Board, a higher education association based in New York.

Based on a survey of more than 3,000 higher education institutions, the board estimates that costs rose by only 6 per cent this year, with the average student living in residence having to pay nearly \$5,000 a year at a public university and more than \$9,000 at a private one.

Going to a high prestige university, however, remains prohibitively expensive for many students unless they qualify for some form of student aid. A year at the Massachusetts Institute of Technology next year will set a student back by more than \$16,000 all-in, with tuition fees alone exceeding \$10,000.

Harvard, Princeton, Yale, Tufts and Brown all cost more than \$15,000 when accommodation and incidental expenses are included.

Mr George Hanford, president of the College Board, described the slowdown in costs as good news for students and their families. The slowdown follows a decade of

Staffing and other shortfalls mean that many proposed courses cannot be initiated, says the authority. It has supplied the minister with a list of courses which cannot be started because of the present funding difficulties. This list includes developments in biotechnology, information technology, telecommunications, agri-business and marketing.

"It would appear that the damage to the national economy of not making good this shortfall cannot be emphasized strongly enough," says the memo.

Turning to libraries, it says that in the five university colleges the number of book purchases from 1981 to 1983 has fallen by 3 per cent and the number of periodicals by 10 per cent. In the newer institutions the number of posts sanctioned has been totally inadequate for library services.

The memo adds that severe cutbacks on maintenance expenditure have been forced on all institutions in recent years and particularly since 1981. This is false economy, giving rise to more rapid deterioration of expensive buildings and equipment and a build-up of greater repair costs, it claims.

Long lists are available of essential maintenance which have been deferred in some cases for years are available, it says.

Some of the results of deferring maintenance are now apparent - worn-out fixtures and fittings including sanitary fittings in toilets are not being replaced; damaged electrical fittings are disconnected rather than renewed; tiling walls are not mended; cleaning services have been significantly curtailed; and considerable areas have remained unpainted for more than 20 years.

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overseas news



Dr Mahathir: concerned



Mr Hawke: prime minister

Malaysian premier raises student restrictions question

from Geoff Maslen

MELBOURNE The Malaysian prime minister, Dr Mahathir Mohamad, has expressed concern at recent restrictions on foreign students entering Australia.

During a visit to Australia, Dr Mahathir raised with the Australian prime minister, Mr Hawke, the freeze on foreign student numbers in Australian higher education institutions in 1985.

Students from Malaysia are the largest national group of private foreign students in Australian universities and, with those studying in secondary schools in this country, make up more than 55 per cent of those from overseas.

Dr Mahathir did not address the issue of his own government's discrimination against its Chinese citizens in his talks with Mr Hawke. But he did express concern at social problems Malaysian students face in Australia. At present, students from Asia are concentrated in a few universities such as Monash and the University of New South Wales, where total foreign enrolments now exceed 13 per cent.

The policy has seen increasing numbers of Chinese Malaysians being

forced to travel to Australia, New Zealand and Britain to continue their education. According to a study by Professor Stewart Fraser of La Trobe University in Melbourne, the number of Malaysian students in Australia increased by more than a third between 1980 and 1982 and has continued to rise.

The Malaysian government refused in 1982 to allow the establishment of a private university predominantly for Chinese. The would have met the needs of those who are now being forced to go abroad for the post-secondary training.

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Starting salaries 'still low'

The stirrings of economic recovery in the United States have begun to improve job prospects for university graduates, but have not yet caused a significant increase in starting salaries.

A report issued this month by the College Placement Council said students graduating this year from a sample of 162 colleges and universities had received 42,393 job offers compared with 33,644 last year.

Salaries, however, showed little change, with employers continuing to offer markedly different rates to engineers, scientists and graduates in the liberal arts and social sciences.

The biggest earners in 1984 were graduates in petroleum engineering, who received starting salaries of nearly \$30,000. Chemical and electrical engineers received between \$26,000 and \$28,000.

Other graduates received considerably less, although their starting salaries were beginning to increase at a faster rate than those for engineers, the survey found. The average offer for a social sciences graduate was \$17,400, some 10 per cent more than last year.

The outlook for graduate employment over the next decade may not be entirely favourable, however. In a separate report the government's Bureau of Labor Statistics warned this month that more than 20 million graduates entering the labour market between 1982 and 1995 would be competing for only 17 million graduate-level jobs.

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Campus police station closed after shooting

from D. B. Udalgama

COLOMBO

The campus police post which was at the centre of an incident in which a student was shot dead, has been removed on the orders of President J. R. Jayewardene, who is also minister for higher education.

Police Opposition parties which urged the prime minister, Mr R. Premadasa, to remove the police post repeated this demand in a communication to President Jayewardene on his return from a foreign tour.

The police post at the Peradeniya campus was set up when undergraduates held a dean hostage last year. Since then it has been a subject of controversy, and students and trade unionists have demanded its removal. It was believed to be the only police

post at a university anywhere in the world. The Opposition parties have also renewed their demand for an independent commission of inquiry into the incidents in the universities in June in which the communication to President Jayewardene. Earlier he turned the request down, saying that the courts held that the police had acted within the law. The Opposition parties say he was misinformed and that no such verdict has been returned.

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PARTY LINE

The political generation gap

I read Quentin Bell's excellent biography of Virginia Woolf and some of her diaries while away on holiday. Her literary achievements, and those of so many of her contemporaries were, of course, immense, however, it struck me as remarkable that her mind remained so detached from the turbulent politics of the time when her husband and so many friends were deeply involved. These activities have been much chronicled, but another volume of holiday reading, Andrew Boyle's *Climate of Treason*, was a reminder of other less auspicious fruits of that latter era and the elite Oxbridge environment, the products of which overlapped considerably with the Bloomsbury set.

What a contrast between those 1920s and 1930s and the 1980s and 1960s when the two other writers of this column and myself had our school and higher educational experiences. A very different background to that of colleagues of the generation of, say, Denis Healey, Roy Jenkins and Keith Joseph. The seachanges in the country after 1918 and after 1945 fundamentally altered attitudes. New views of social justice, of international relations of the importance of freedom

and civil rights, of the role of the State. New views on social services, on education, on Empire and our position within the world. New developments in armaments and new alliances to seek security. New aspirations and horizons undreamed of only a decade before, never mind as much as 20 or 30 years before.

Three out of four leaders of our national parties now are products of the 1950s and 1960s one, Mrs Thatcher, of the 1930s and 1940s. Interestingly not the 1920s and 1930s. I think she demonstrates sensitivity to the contrast this might bring when she appointed the so-called youthful John Selwyn-Gomer (45) as Conservative Party chairman to succeed Cecil Parkinson. That, anyway, was the burden of the briefing at the time.

Will those formative influences make any difference? Will we get new approaches from the opposition parties more in tune with the electorate's views and aspirations? After all, at the next election more than half of the electorate will have been born since the last world war. Might this not be fertile ground for a new and younger leadership?

To me that will depend upon whether that younger leadership is able to articulate policies that make sense to the electorate, in a way that they find attractive. I have known Neil Kinnock since student days and there is no doubt that he can communicate with people in an attractive way. His sense of humour and the contrast with Michael Foot have given him and his party a substantial boost. But in content I have always found him back in pre-war days fighting the old battles of the Labour movement of the early part of the century with

vehement Welsh rhetoric also reminiscent of those times. He is considerably less radical than Mrs Thatcher. Such new thoughts as have crept out of his office since he became leader, bear the familiar fudging hallmarks of the left/right internal balancing act rather than any new approach to British politics.

I hope I will not be accused of being too partisan or prejudiced if I lay the claim that my own party's leader, David Owen, has made a number of thoughtful attempts over the past year to articulate views which have not been taken up by British political parties in the past. I don't think he would claim that they are yet fully honed, but the response has been very encouraging indeed, and certainly enough to ensure that we continue working them up for the next election. I found it very interesting that some

of the proposals and attitudes expressed by Gary Hart during his bid for the Democratic nomination for American presidency bore a marked resemblance to the sort of things David Owen had been saying.

But while it is absolutely essential to have a programme that appeals to the electorate, it is not the only thing that matters. Some on the left have consistently argued this as they seek to turn their public representatives into puppets to a party policy laid down by the party machine for them. The voters are wiser than this. They know life isn't so simple. The character of people affects decisions. They want people who will take decisions in the national interest and exercise their judgment with good sense. The character of the leaders from the 1950s and 1960s will bring a new element to our next General Election and it will be interesting to see what changes, if any, they bring with them.

Ian Wrigglesworth
The author is Social Democratic MP for Stockton South.

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overseas news

Nuclear physicists told to think again

from Peter David

WASHINGTON

Congress has sent nuclear physicists in the United States back to the drawing board to make sure they really need to build a new \$220m electron accelerator approved by the Reagan administration two years ago.

Work on the accelerator, designed by a consortium of 23 universities known as the Southeastern Universities Research Association, was to have started in 1985. But under pressure from the Senate, the White House office of science and technology policy has asked the department of energy to review the scientific merits of the proposal.

The request is certain to spark renewed arguments between American laboratories, which have already spent more than two years competing for permission to build the machine. In what most physicists had expected to be a final decision last year, the Department of Energy chose the SURA proposal over three competing

designs, including one submitted by the Argonne National Laboratory in Chicago.

Although the administration endorsed the department's decision last year, and included start-up money for the SURA in the fiscal 1985 budget request, the massive sums of money involved kept controversy alive throughout this year's budget debate. In June, Congress voted \$3m for research and development on the accelerator, but nothing for construction.

Critics of the SURA proposal have expressed doubt about the ability of an entirely new university consortium to develop a big accelerator as efficiently as an established federal laboratory such as Argonne.

Some scientists question whether the SURA's design will live up to expectations and produce the hoped-for insights into the way quarks within protons and neutrons determine the behaviour of atomic nuclei.

The debate has also become embroiled in bitter regional politics,

with senators from Virginia and Illinois trying eagerly to win massive investment for their home state. Senator John Warner, the Virginia Republican, has become identified so closely with the SURA machine that it has been dubbed "the Warnertron" by some Congressional aides.

Most observers doubt whether the Department of Energy will reverse its decision so soon after its own nuclear science advisory committee said in a report last December that construction of a continuous electron beam accelerator should be a top priority for American nuclear physics.

But the politicization of the SURA issue is raising doubts within the American physics community about the feasibility of persuading Congress to pay for the much more expensive Superconducting Supercollider (SSC), which is expected to form the centrepiece of a separate but related high energy physics programme up to the end of the century.

Construction of the 20-trillion elec-

tron volt particle accelerator was strongly recommended by a Department of Energy advisory panel last year and has widespread support within the Reagan administration. But it is expected to cost about \$3,000m, and a final go-ahead is unlikely unless competing universities and laboratories are able to mount a unified campaign for the money.

The policies of the SCC are likely to be even more fraught than the SURA's, because of a major international dimension. At the London economic summit in May world leaders suggested that the cost of a high energy accelerator made it a good candidate for international cooperation.

Inevitably, the opening shots have already been fired in a transatlantic battle for the right to build the new particle physics (CERN) is suggesting that modifications of its proposed Large Hadron Collider could be a cheaper alternative to the SCC. American physicists, however, are adamant that the machine should be built in the US.

Inquiry examines pay claim

from Patrick Knight

SAO PAULO

A commission set up by the rectors of Brazil's 24 federal universities is examining the wage claim which led to an 84-day strike of university staff, suspended on August 8.

The commission has 30 days to make its recommendations, and if they are not felt to be satisfactory, the 3,000 university teaching and 80,000 auxiliary staff say they will resume the strike. The action affected Brazil's 360,000 university students, who lost 34 teaching days. The term will have been extended into the end of vacations in December and January to make up for lost time.

The teachers have been badly hit by the decline in purchasing power of the middle class in Brazil over the past years. Last year, Congress passed a law which set wage rises to average only 10 per cent of the inflation rate, which is now running at above 200 per cent a year. The law was aimed at Brazil's massive public sector, which has grown enormously in the past few years, but teachers have been one of the main victims.

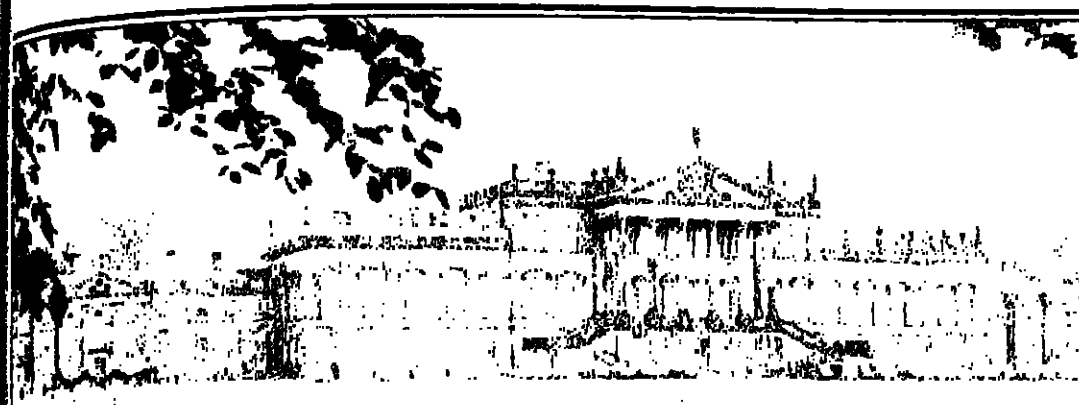
University staff claim that their incomes have declined by more than half over the past four years, and that full professor's salary, which was equivalent to \$1,500 a month in 1982, has now declined to be the equivalent of only \$700. They claim that the universities are the target of a government plan to run them down.

In recession for the past few years, university graduates have been finding increasing difficulties in getting jobs, in common with their European counterparts. However, as the country is still very undeveloped, this must be Brazil's case, be only temporary. One of the present financial problems, caused by the country getting too deeply into debt, are over, demand for qualified people is certain to rise sharply again.

The long strike was characterized by tough positions by both sides, with the minister of education Esther Ferraz, digging her heels in, and refusing to make any concessions for more than two months. With the backing of the

Netto, architect of the wage policy, implemented at the behest of the left, it seemed that the teachers were to be made an example of. Private industry has been quietly ignoring the wages law, and giving their staffs rises well in excess of the 80 per cent decreed by law. The teachers are insisting that they should be given 100 per cent of the cost of living increase, and that the next rise should be at least 110 per cent of inflation.

The strike was on the point of being declared illegal by the minister, when intervention by politicians, and by Brazil's prime minister, Antonio Carlos de Figueiredo, cooled things down. Staff were paid normally throughout the strike, but this would have ceased, had it been declared illegal.



Sheffield City Polytechnic's eighteenth-century Wentworth Woodhouse (above) and Preston Polytechnic's Elizabethan mansion Bortwick Hall (right)

The house-proud polys

Karen Gold looks at an unfamiliar aspect of the polytechnics... their architectural heritage.

Eighteenth versus twentieth century interior design at Trent's Clifton Hall (below); Teesside's Victorian clock tower (right)



used for storing bicycles.

The interior of Scaptoft Hall suffered from 1950s institutional partitioning. But that is not true of Trent Polytechnic's Clifton Hall, once home of the Clifton family and now of the polytechnic's education faculty.

Clifton is Nottingham's largest remaining Georgian house, although it also incorporates an earlier seventeenth-century building. It contains a unique room of military wall paintings, and its ornate ceilings and decorations have been restored in recent years.

Wentworth Woodhouse, Sheffield City polytechnic's major stately home, is also exquisitely decorated, although the Fitzwilliam family who owned it before Rotherham Council leased it to the polytechnic in 1977 removed many of the pictures, statues and other furniture.

The house was built of wood in Tudor times and reinforced with stone at later intervals, but its present Palladian form with a large additional stable block dates mainly from the mid-eighteenth century. Out in its 150-acre

grounds are a 15 foot column - recording the acquittal on a cowardice charge of an admiral friend of the fourth Earl Fitzwilliam - a three-storey mausoleum, a rotunda and a beer pit.

The Grange at Leeds Polytechnic is on a smaller scale. But it has just been restored over 15 months, including repainting in surprisingly bright, fresh colours as near as possible to the eighteenth-century originals.

The Grange was originally one of three outlying farms belonging to Kirkstall Abbey, which dates back to 1152. It was rebuilt in the seventeenth century, and extensively altered again in the 1830s. Its rather sturdy exterior makes the graceful rooms inside - where Lord Grimethorpe, the brains behind the first Big Ben once lived - even more surprising.

Appropriately both Portsmouth's most interesting historic buildings have connections with water. The Mill-dam building, as its name implies, was a mill powered by the tides in a creek inland from Portsmouth harbour

which was dammed.

The area has a gruesome history: the last mill, built in 1775, was burnt down in 1868, but before that the mill dam was described as a "sink of pollution" by the local *Hampshire Telegraph*, which noted the bodies of infants, suicides and drowned dogs regularly in its stinking waters. In 1866 it was filled in, and a ragged school and barracks built on the site, which are the buildings now occupied by the polytechnic.

Portsmouth's King's Rooms were built in 1816 as the Pump Rooms, and were renamed in commemoration of a visit by William IV. On May 19 1845 they were the site of the last fatal duelling challenge issued in England, by Lieutenant Charles Hawkey to a Captain Alexander Seton who, during a ball that day had been over-attentive to Hawkey's wife.

The duel took place the following day, with Seton fatally wounded in the hip. Hawkey was later tried for murder, but acquitted by a jury which considered he had been provoked. The duel created a scandal and was the last

in England. The King's Rooms themselves were rebuilt in 1880.

Scandal of a different kind touched Kingston Polytechnic's Kingston Hill Place, home of Lily Langtree, mistress of King Edward VII. It is one of three nineteenth-century buildings on the Gypsy Hill site of the polytechnic. Historical interest in the area goes back a good deal further: Cardinal Wolsey built a conduit 3½ miles from Kingston Hill under Kingston and the Thames.

The two other buildings on the site, Kenry House and Connoe Hurst, also have famous connections. The latter was built in Victorian Gothic style in the late 1830s by Samuel Smith, uncle of Florence Nightingale. Kenry House, built around the same time, was bought by Baron Kenry in 1872. He was a war correspondent, politician - present at the Treaty of Versailles in 1919 - and an adventurer who once met Buffalo Bill. The father of novelist John Galsworthy designed much of the surrounding area, and one of the two houses is thought to be the model for Soames Forsyte's home in *The Forsyte Saga*.

Returning north, Teesside Polytechnic, though without anything that could be called a stately home, has an 1875 redbrick building with a fine clocktower. Originally Middleborough Girls' High School, it was designed by Alfred Waterhouse, who was drawing up plans for the Natural History Museum in South Kensington at the same time.

Liverpool Polytechnic has a number of fine examples of Victorian architecture, including the original college of art in Hope Street, the former Jewish school in Hope Place, and the Notre Dame complex, a former convent built between 1825 and 1895, with a grand staircase and vaulted ceilings.

Finally North Staffordshire's Cadman Building, which was the 1914 Central School of Science and Technology and is now the central administration for the polytechnic's Stoke site, is noted for a rare frieze over the portico showing miners and pottery workers at work, reflecting the historic industries of the area.

The extent to which polytechnics are glad to have their historic houses varies a lot. Some, like Leeds and Trent, have invested to make them showpieces, even though mainstream work - maths and computing in the former, teacher education in the latter - goes on there. Others, like Hatfield, Preston, Middlesex and in the future Liverpool, use their grander settings to attract conferences and business. Other, like Portsmouth and Kingston, simply count them among their square footage.

But the most impressive can also be the most expensive. Wolverhampton recently pulled out of Himley Hall, the 1740 home of the Earl of Dudley. Newcastle gave a grade II listed building back to the city to run. Bristol is considering getting rid of its Edwardian college of commerce and withdrawing from the nineteenth-century orphanage blocks shared with Brunel Technical College. Hatfield is currently disposing of Bayfordbury, a Hertford mansion house dating back to 1760.

And the latest casualty: Wentworth at Sheffield is to return to Rotherham Council at the end of the coming academic year in order to save money. Polytechnic figures show that courses at Wentworth in 1983 earned more than £20,000. That was only 10 per cent of the amount needed to make it viable. The historical and architectural value of polytechnic buildings does not, in the end, pay bills.

Policy options explored

from Lindsay Wright

WELLINGTON

Victoria University, Wellington, has launched two new research institutes supported largely by outside funds. This tradition is well established in medical research, but unusual in other fields in New Zealand.

The Institute of Policy Studies, directed by Mr Malcolm Templeton, former deputy secretary of foreign affairs and Mr Peter Hall, an oil company executive seconded to the university, is probing a range of policy options for the country in projects funded by both the government and industry.

New Zealand's role in Pacific development is under investigation in a research programme funded by the Ministry of Foreign Affairs and taxation options are being investigated in a project supported by the Treasury and private enterprise and involving a large team of university and other researchers.

The 40-member management committee set up by the university for the institute is headed by the former Treasury secretary Mr Henry Lang and includes New Zealand's leading economists, industrialists and public servants.

Set up with the support of the government, the institute is intended to be an independent source of advice on policy options and a national "think tank" to generate discussion on issues of practical concern.

Beside the institute on the Victoria campus is the newly established Stout Research Centre, funded from a charitable trust to foster studies of New Zealand society, history and culture.

The centre's first research fellow is the distinguished music historian Mr John Thomson, founder and for many years editor of Oxford University's quarterly journal *Early Music*. He has been joined there by scholars working on the New Zealand oral history archive.

Seven scholars-in-residence will be based at the centre next year and one room will be kept for short-term visitors to Wellington who use the city's research resources in the National Library, National Museum, National Archives and libraries of government departments.

Both the Institute and the Stout Research Centre have involved interdisciplinary collaboration and called for substantial work in obtaining financial support from the community.

The Stout Research Centre will work closely with the developing Maori Studies Centre at Victoria.

The Institute of Policy Studies shares its building with the long-established Institute of International Relations, an independent national organization, which celebrated its fiftieth anniversary last month.

Community health care encouraged

by Thomas Land

A strategy by which the poorest developing countries can introduce fundamental reforms in their medical education and provide essential health care for rural populations was the subject of a two-week workshop on the training of health professionals held in Gothenburg.

The workshop, held at the Nordic School of Public Health, was organized under the auspices of the World Health Organization and the Swedish International Development Authority. The central theme was to amend, if not abandon, the hospital-based health care and university-based medical education model in favour of encouraging rural communities to participate in their own regional health care.

It also envisages scientific use being made of the methods and materials of traditional healers. The Ethiopian Department of Traditional Medicine recently completed a two-year survey of the country's traditional healers, who usually enjoy the trust and support of villagers, with a view to incorporating them into the national medical care system.

The workshop, attended by specialists from countries including Botswana, Ethiopia, Kenya, Tanzania, Zambia and Zimbabwe, considered the establishment - with the help of the WHO, the World Bank and other global agencies - of more than a dozen African sub-regional training institutions in fields such as primary health care, tropical disease research, biomedical instrumentation and advanced nursing.

Social work stops recruiting

The school of social work at Israel's Ben-Gurion University in Beersheba will not take any new students in the coming academic year, the university's new rector, Professor Haim Ellat, has announced.

He said that the major government budget cuts, trimming some \$6m from the institution's budget, have forced the university to drastically cut the social work school's budget.

No new lecturers will be hired, all non-tenured teachers will be fired and the school's academic staff will comprise of only five teachers next year.

The 30-odd students accepted by the admissions boards for first year studies at the school have been turned away to study other subjects or to go elsewhere. The two-year-old school's 50 second and third year students have demonstrated against the cutbacks, protesting that the school was being "strangled".



Families normally trust traditional heaters

A recently established teaching materials network comprises eight African universities cooperating in the adaptation, translation and dissemination of medical texts. Various national health institutions are already being reorganized into cooperative regional networks concerned with medical education, health care, pharmacology and sanitary engineering.

Some African universities are to run formalized training courses for qualified practitioners of traditional medicine in the hope of eliminating unhygienic practices, such as the use of rusty tools in circumcision operations. As one African specialist put it: "About half the drugs used in modern

Western medicine originate from nature's plants, living organisms and animal products" which comprise the raw materials of the traditional "pharmacy".

The Gothenburg school is financed by the Nordic Council whose member nations are deeply committed to international cooperation in medical care and education in the developing regions.

The school has professorial chairs in community health, epidemiology, health services management and environmental health. The workshop was held as part of the school's current policy of increasing its support for primary health care in the developing countries.

Economic crisis hits Mexican universities

from Emil Zubryn

CUERNAVACA

The Mexican economic crisis, which continues despite constant claims by the government that recovery has begun, is seriously affecting higher education in Mexico.

Francisco Javier Salazar, coordinator for the National Association of Academic Personnel Unions, said that academic levels have been deteriorating for various reasons. Partly this is due to inability to obtain equipment, working materials, books and special papers, magazines, etc.

But the main difficulty is that professors cannot subsist on salaries received. Therefore, approximately 80 per cent of academic personnel, according to Javier Salazar, work at two jobs to the detriment of their educative duties. This also holds true for university research workers.

Textbook costs have soared enor-

mously over the past two years, and both professors and students find purchasing these an economic hardship. The books are not provided free by either the university or the government.

Javier Salazar warned that the purchasing power of professors will continue to deteriorate over the short term. Already hardest hit by the economic crisis, salary adjustments must be made to keep pace with soaring living costs, otherwise the desertion of teaching posts which has already begun will accelerate. The highest professional wage in Mexico is 113,000 pesos (\$621) monthly, before tax, which is high.

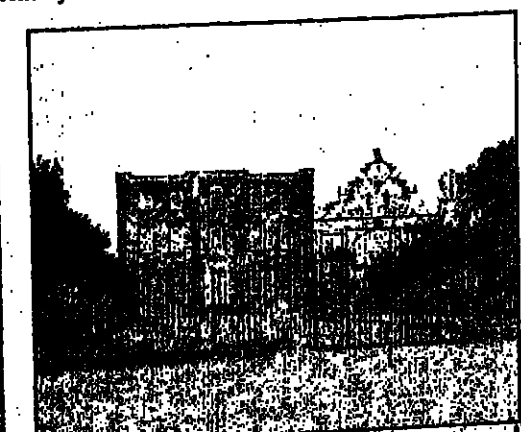
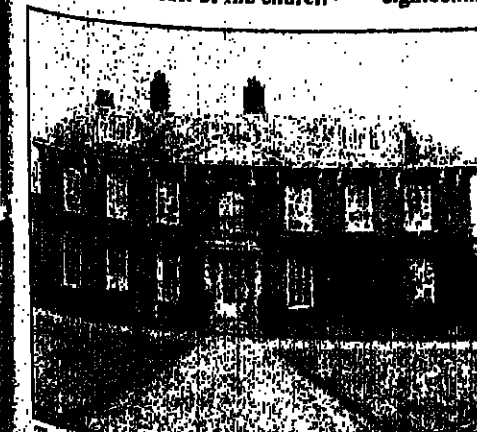
While bureaucrats, workers in industry and white collar workers have received pay adjustments, academic personnel have not seen any major income increase. The reason for this is that university budgets are tight as it is.

Javier Salazar claimed there are

ex-deans and deans, as well as political groups, who are using universities as "political battering rams" to further their goals of acquiring strength in the political arena, and to disrupt the orderly functioning of government.

The government has been giving higher subsidies to universities which have created problems in the educative system, he said. On the other hand, institutions that continue serious work must make do on reduced budgets.

Another indication of the seriousness of the problem in Mexico was revealed by the National University of Mexico's faculty of accountancy and administration. In the past eight years, 25,000 students who completed their courses either as public accountants or for administrative posts in business and industry, have not returned to present their theses, and take the professional examination leading to a diploma. As a result they may be employed in minor positions, or work in areas far afield from their studies.



Three centuries of stately homes: Balls Park (Hatfield - 1640); Scaptoft Hall (Leicester - 1723); Combe Hurst (Kingston - 1836)

The British Government has committed £200m to research in artificial intelligence and advanced computing during the five years of the Alvey Programme. The total expenditure of the Economic and Social Research Council over the same time will be around £125m.

The bald figures mean two things to social scientists contemplating the British research scene. For students of social institutions, artificial intelligence (AI) is clearly an important venture, which will have large social effects. And, since some AI goals touch the heart of psychology and cognitive science, Alvey is also a potential source of cash when the ESRC is still feeling the effects of Sir Keith Joseph's distaste for social science.

One of the ESRC's jobs over the next few years will be to juggle priorities to suit both kinds of social scientists — those who want to analyse the Alvey bandwagon and those who want to climb aboard. Some analysts will draw directly on Alvey funds, but their work will be restricted to attempts to measure the effectiveness of the Department of Trade and Industry led programme in its own terms — what economic and industrial benefits will flow from this investment?

But what of the wider questions raised by the ambitious aims of AI programmes in Britain, Japan and the US? It is not hard to see that the uses of "intelligent" computers exemplified by the demonstration projects Alvey has recently begun could have important consequences — consider the potential impact of a computer system dispensing expert advice on social security benefits, for example. But there is no provision under Alvey for work on these consequences.

When Dr Karamjit Gill of Brighton Polytechnic asked Alvey for £500 to underwrite expenses for a small conference last month on "Artificial Intelligence for Society", the DTI could

Artificial intelligence test

Jon Turney examines the role of British social scientists in advanced computer research

not help. Happily, the ESRC's education and human development committee found the money, and the conference went ahead as one of the first attempts to see how the social effects of AI might be thought through.

The idea of the meeting, organized by the polytechnic's social and educational applications of knowledge engineering (SEAKE) group, was to bring together experts in AI with teachers and researchers versed in other fields to see what they could tell each other.

The results were mixed. It is very hard to make much headway discussing a new technology before it is upon us. One can draw analogies with the effects of known existing technologies like new information and communications technology already in use. But examination of the narrower field of artificial intelligence — machines which can emulate some human faculties of reasoning or perception — is more often philosophical than sociological.

Nevertheless, some useful general points emerged. Professor Margaret Boden of Sussex University argued that AI would not be dehumanizing, as some fear, because the sheer difficulty of reproducing commonplace human abilities like vision and language will increase our respect for the mind. But she foresaw some hazards in our interactions with relatively stupid AI systems.

"In the short run, AI is potentially very dangerous for users in the public domain," she said. People would tend to grant low-level systems much more intelligence than they actually possessed because they some-

times make the right responses. Every AI system would have assumptions built into the programming which would limit the advice it could offer, but a human user might believe it had examined all the options. For example, a medical system would very probably prescribe whatever treatment expert reasoning told it would prolong the patient's life. But sometimes quality of life might be more important than simple longevity.

The question of assumptions can be taken further, as Dr Partha Mitter, also of Sussex, did when he asked if AI researchers realized they were embedded in Western culture. Suggestions that powerful new computer systems would help solve the problems of the Third World took little account of the influence of different cultures on the perception of problems. As a cultural historian, he believed that AI shared a notion of cultural homogeneity common to much scientific thinking.

Another way of putting this is to suggest that the assumptions built into a machine, especially a machine which is designed to have knowledge, will affect the user. John Young, a technical adviser to the Great London Council, suggested that most system designers conceived a human operator as having fixed qualities or properties which must interface with the machine. But he believed this was the same as assuming the operator was a machine as well.

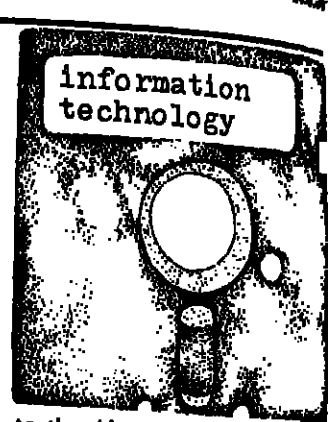
Here, there was a link with other work recently done by the ESRC in trying to define the role of cognitive science in the overall AI research

programme. Two university psychologists, John Churcher of Manchester and Nigel Shadbolt of Nottingham, recently submitted a paper on "A Framework for Research in Cognitive Science" to the council, in which they manage to be implicitly critical of some Alvey ideas while making a strong argument for Alvey funding for new work in cognitive science.

The framework Churcher and Shadbolt propose emphasizes, among other things, the interaction between computer systems and human cognition — each influencing the other's view of the world. And they stress that computational models of the human side of the interaction neglect the developmental and social features of human cognition, as well as questions of motivation, rationality, aesthetics and imagination.

They conclude by recommending that the ESRC seek collaboration with Alvey in a variety of existing areas, and in a new priority area, "dynamics of change in cognitive systems". And they highlight another area of interest to cognitive scientists — the effects of new computer networks — by proposing a nationally networked MSc in the subject. They see this as an experiment in new educational methods, a contribution to present training needs, and as the embryonic form of a national cognitive science college built up by wiring together dispersed teaching centres.

Movement on these recommendations is likely to take some time. Meanwhile, there is no lack of social science input into other areas relevant



to the Alvey programme. To judge from another recent publication from the ESRC, the problem is keeping track of who is doing what. A directory of work by social scientists on intelligent Knowledge-Based Systems, Alvey's own special term for expert systems and other "intelligent" specialized programs, lists well over 100 projects. They range from sociological science studying how computer scientists construct new systems, through detailed studies of the way people relate to expert knowledge, to one university building an expert system to help select tenants for a science park.

There are also a range of projects listed aiming to develop expert systems for use in social science research in other areas, including applications in anthropology, political science and the psychology of music. These and the volume of work on evaluating, interpreting or improving other projects in artificial intelligence suggests that British social scientists are developing a secure foothold in this area as it expands in accord with the Government plan.

Intelligent Knowledge-Based Systems, by Linda Murray and John Richardson, UK social science research inputs. Economic and Social Research Council, £2.

For many decades the gap between science and technology has been criticized in both Britain and in the Soviet Union. In Britain, it is often identified as the failure to produce first-class scientists (more Nobel prize winners per capita than any other nation) coupled with the failure to exploit good research in industry. In the Soviet Union the gap was identified by Khrushchev and, more recently, Andropov in terms familiar to British scientists of our universities, namely that scientific output seemed to be disconnected with few practical results for the economy.

In 1916 the British government set up the Department of Scientific and Industrial Research with the aim of founding first-class national laboratories to fill the evident gap between British and German industry to apply the best brains to the identification and solution of its technology. The DSIR advanced laboratories were to serve the direct research teams construct new systems, through detailed studies of the way people relate to expert knowledge, to one university building an expert system to help select tenants for a science park.

In 1917, almost one of its first acts, the new Soviet government, under Lenin proclaimed the importance of science to the development of industry, agriculture and to every aspect of the essential development of the nation. It soon founded state laboratories. There are now several hundred of these and their job, apart from doing pure research, mostly under the auspices of the Academy of Sciences, is to act as research and development centres for the industries and firms with whom they are connected. These firms, however large, do not, as do those private companies in Britain, such as ICI, GEC, KGN, Michelin, Molins Machine or small firms like Cardiac Recorders, have their own research and development departments. They have to rely for such work on the scientific research institutes (SRI) which may be hundreds if not thousands of miles away.

The organization of research and development in the USSR and its difficulties and the reasons for them are interesting and perhaps instructive in the context of the British contemporary scene.

Before the revolution there were some excellent research laboratories, such as the aero-hydrodynamic laboratory in Moscow, directed by Zhukovsky. These are now organized as SRIs, separately from universities, and in a curious way, regardless of discipline; they range from linguistics to heavy engineering plant development.

There are no published figures for the numbers of SRIs, perhaps because of a high proportion of work for the military. However, it is possible to extrapolate the latest available Soviet statistics, those for 1975, which suggest that a total of two million people work in SRIs, of which about half a million hold PhDs. These same statistics record about 280 SRIs belonging to the academy of sciences of the USSR and it is known that these are a fraction of the total. Each ministry responsible for a branch of industry is responsible for one or more SRIs with special and often quite narrow terms of reference. For example, the construction ministry has in Moscow alone SRIs for building construction, concrete, building physics, construction and road building plant, house building, technical assistance and others. Several hundred highly qualified people staff such SRIs which, in view of the importance of the industry, report to a directorate of the USSR council of ministers rather than to a single ministry. SRIs fall into categories, the most important are the all-union ones as these above, lesser ones belong to an industrial, republic, and others are deemed of secondary importance or quality.

The work of an SRI is funded from estimated sources by each directorate of a ministry which considers the plan of work for the forthcoming year and after five years ahead and compares it with its own five-year plan. Alternatively, the work is reviewed by a directorate of the Council of Ministers of the USSR. The work plan results from the initiative of the staff and also from agreements, which may be fairly loose, with individual enterprises with the intention of improving their productivity, etc. Every important enterprise receives from its ministry detailed plans for research and development and for continuous technical improvement, with which it pays the SRIs in view of the practical importance of the practical improvements of science; the Soviet government (in



Keeping the red tape flying

A. Kennaway and V. Lapidus examine the relationship between science and bureaucracy in the USSR

its own version of the Rothschild principle) has demanded the highest possible volume of contracted work from enterprises.

The director of a technical SRI is usually an eminent and experienced research worker holding a Doctorate of Science, who is prepared to accept that, for all practical purposes, he is unlikely to have time for his own research or to return to that work. As a departmental head, this may have been fully occupied with administrative and formal work, in spite of the fact that he has a deputy for administration and for domestic affairs.

In the last decade or so such jobs are increasingly taken by people in their late thirties, mostly Party members, who have replaced the older generation who were often from the traditional intelligentsia. An important SRI may well have 1,500 to 2,000 personnel working in departments organized either by application or by discipline. The departmental heads will also be Doctors of Science. The graduate staff will consist of PhDs and those working for this degree, known as aspirants, as well as other junior staff with diplomas, equivalent to a British MSc. Responsibility for a project will, in important SRIs, be carried by those with DSc and PhD and in less important ones by the senior scientific associates who are normally PhDs. Junior staff, the diplomats, carry out the research work, assisted in the usual way by technicians. Scientific associates are not considered to have tenure; their jobs are theoretically open every five years to open competition.

In order to retain his job or to achieve promotion an officer must submit his application together with a list of his published work. In practice, however, for long-established officers, this is a mere formality. However, the review is convenient for releasing inadequate people. In such cases, the scientific council, consisting of the director, deputies, department heads and senior Party secretary, can release a man regardless of the volume of his published papers. The council also has eminent scientists invited from outside the institute and usually consists of 25 to 35 members. In important institutes, the council can award higher degrees.

This brings significant benefits; the salary of a PhD will be about 50 per cent above that of a diploma and that of a DSc often three to four times. Additionally the holder will have tenure and thus the all-important right to live in a capital city or other major conurbation.

The staff of an SRI has available all the normal, essential facilities. Its information section may obtain important world literature reprinted in the original language, since the cost in hard currency has restricted supply of the originals. Many of the older staff read freely one or more of the important international languages such as English or German, younger members more frequently will have at least a rudimentary reading of these languages. The section also undertakes translations of required references.

Freedom to travel abroad, as is every Western organizer of a scientific conference knows, subject to prolonged procedures, arbitrary rulings

and sometimes abrupt cancellations. Such visits are part of the reward system for senior, highly qualified and trusted people, whose Party credentials are also a factor. Requests are made through the echelons of the ministry to the highest authorities and the sanction of the State Bank is normally required for allocation of the foreign currency.

Important SRIs have special sections responsible for programming and computing, for manufacture of prototypes, for instrumentation and measurement. The machine shop normally requires fully-detailed drawings for prototype manufacture and thus the normal process of trial and error is longwinded. Once a prototype is fully accepted by the SRI it is transferred to the client for field trials. It is now essential for the SRI to obtain a certificate of acceptance from the client.

The plant, for its part, is often not eager to put a new piece of equipment through its paces. This is because such plant would have to be located within an existing production line and production outputs put at risk. As a typical example, some years ago the trials of a new coal cutting machine, of excellent performance, designed by the appropriate SRI were held up for a very long time. The mine had four productive faces, the machine would have had to be installed on one of them and the inevitable loss of production, due to the usual adjustments and stoppages to experimental equipment, would have meant that the output plan could not have been met and that the workforce and management would have lost bonuses, the latter reprimanded or worse. Consequently, management resorted to regular practice of delaying tactics, writing to the SRI complaining that the machine had not been delivered in complete. The correspondence was maintained long enough for the machine to become corroded and require repair.

The SRI is desperate to get its release certificate which it gets by appeals to the old principle of live and let live, lubricated by an alcoholic celebration at the mine paid for by the responsible development engineer. He can submit his PhD thesis, the SRIs plan is reported complete, bonuses are paid.

The mine? It reports in due time to its ministry that all necessary preparations are being undertaken in order to commission the new, advanced coal-cutter. This statement is easily condensed in the brief for the speech by the minister, reported in the press, that a new highly productive coal cutter has been put into production by the Red Banner Mine at Vostok. All is well, the production plans of the mine and of the SRI are fulfilled while the machine moulds in the yard.

The plan of the mine is rigidly based primarily on output norms, usually too inflexible to allow for introduction of experimental equipment. The mine, like many other Soviet production units, is allocated inadequate funds, personnel and resources for technical development work and it has to get by on its own resources. A management on innovation will camouflage reality in order to succeed.

Crude, physical indices of performance commonly employed in Soviet society for decades lead to senseless and wasteful results even in SRIs serving high technology military objectives. For example, not too many years ago it was reported that, in the Soviet Union, the Royal Signal and Radar Establishment a considerable quantity of scarce titanium, that had been carefully saved for an important project, was withdrawn from stores and delivered to a scrap merchant in order to make up a deficiency in scrap deliveries envisaged by the plan.

An SRI may devote much time to the study of theoretical aspects of a subject of industrial importance. One such, some years ago, studied the mechanics of plastics processing, then a rapidly developing subject in the West and a field in which Soviet industry was only just beginning and lagged badly. A competent précis of the work appeared in the journal of the SRI complete with mathematical analysis and a nomogram for its application by those incapable of grasping the mathematical argument. But it was reproduced in condensed format such that it was unreadable. The effect of the paper was almost certainly minimal for some years since engineers in the factory would not have been able to apply the results to their equipment and no published simplifications were issued and the machine building works had no understanding of plastics processing.

In technical work it is commonplace that problems arise less within a continuum than they do at the interfaces. This is true between components of a composite material, between sub-assemblies in a machine and building. It is also true between individuals, of different disciplines, between departments of an organization and between different organizations. The Soviet system reinforces the surface energy at these interfaces, ensuring that they become barriers rather than links.

This, of course, is not unknown in British society, especially between universities and private enterprise. It is not unknown either in those large companies with cumbersome bureaucratic and financial control procedures. Our senior civil servants have become adept at deflecting the crucial thrusts of a staff review. They are now becoming skilled at playing the new game of MINIS recently introduced in order to identify rigorously the objectives of the organization and to reduce to essentials the resources needed to carry them out.

We may also recall the demise of the groundnut scheme, in which unsuitable agricultural equipment was sent to East Africa, and that of the National Coal Board smokeless coal briquette project. ICI's colour film project failed because it outstripped the company's very limited understanding of coating and making film to photographic standards. Its ambitious project to cast complex Fresnel lenses from methacrylate failed because the company wrongly considered that projection TV would take over from cathode ray tubes. Such failures are due more to arrogance, failure to understand the market and incompetence of individuals and of their managers more than to faults designed into the organizational structure.

Both the Soviet and British diseases are curable; all that would really suffer is the role and arrogance of the bureaucrats, and of those who like to work within narrow constraints rather than seeing the objectives in a broader context and fitting themselves to move across present interfaces between disciplines and the organization of the establishment.

Professor Kennaway is in the department of mechanical engineering at Imperial College. Dr Lapidus now lives and works in London.

The best firms, large or small, on the whole, carry through innovation reasonably well. This is because the success of the whole project is in the interest of a unitary management who have total control over each phase and all personnel involved. For example, in such firms it is commonplace for a development of a major new production system to be planned from the outset between the research and development staff, the technical and operational management of the works and for the development engineer to accompany the equipment to the factory in order to help with its commissioning, debugging and training of plant personnel. He may not just stay for a few months but may be transferred to the factory technical team for some years as the next educative stage of his career.

This is almost impossible in the USSR since an engineer once in an SRI will be very reluctant to leave since this would require him to work far harder in factory conditions, lose him the privileges associated with an SRI and the right to live in a capital city. Consequently such cooperation as does take place is at arm's length or through fleeting visits from factory personnel to the SRI, which are hardly adequate.

In the USSR, the state has provided the SRI, more especially the favoured ones, with every physical resource needed to carry out its work; it has laid down a theoretically admirable system whereby the customer may initiate work and which gives freedom to the research and development staff to propose new initiatives, whereby the work has to be approved by the customer.

But these systems are a two-edged weapon which inevitably seriously reduces the effectiveness of the very large investments the state has made in people and resources. The rigidity and bureaucratic nature of the plan, the use of crude measures of success in fulfilling the plan, the concentration upon which mesmerises people to the exclusion of real success provide part of the negative aspects.

The Party also insists that scientific work is tailored to Party dogma and like the Procrustean bed, projects must be closely fitted to specific sections of the latest decrees of the Party Congress. This also severely reduces the freedom of action of real technicians and scientists. These people have long memories and remember the excesses of Party dogma which proscribed quantum mechanics as bourgeois idealism, preferred quacks like Lyenko and ruined the career and life of competent scientists like Vavilov.

There is perhaps no better example of misuse of wholly admirable objectives than the role of higher degrees in Soviet society. Faced as it was with a serious shortage of qualified scientists and engineers the state encouraged people to study for higher degrees by awards of privileges. The pursuit of these degrees is now so important to the individual whether the younger man taking his PhD or the senior who aims for the DSc that this objective has overridden the duties of an SRI to industry. The Soviet government is aware that it now has too many engineers and PhDs; this provides one possible explanation for its current emphasis on manual work and craft in school and the drive toward technical training.

It is possible therefore to conclude that both in the UK and USSR the difficulties of applying effectively the undoubted intellectual capability of research and development staff in institutions to industry stem from the fragmentation of society and of the intelligentsia; in the Soviet case through excessive centralized bureaucracy and a system crystallized into a rigid maverick contrived dogma. In the British case, the fragmentation stems from long-standing social tradition. The condition of British contemporary society is such as to cause useful parts to become amorphous enough to free themselves from these self-imposed barriers.



Nomad expert denied freedom of movement

To many westerners, nomads represent a kind of romantic life, herders roaming free, unopposed by the materialistic vices of civilization. For Russians however, nomads are a part of life, deeply rooted in their history. It is not surprising then that the first really comprehensive study of nomadism has been written by a Russian scholar.

The study, *Nomads and the outside world*, by Anatoly Khazanov, a professor in the Institute of Ethnography of the Academy of Sciences of the USSR, has just been published in English by the Cambridge University Press. According to leading Western anthropologists it is a massive achievement, the first fundamental text on pastoral nomadism, complete with full bibliography. It also takes one of the great unresolved debates within Marxist circles, how to explain a social structure that appears to develop cyclically rather than progressively as Marxism requires.

Professor Khazanov was in many ways uniquely placed to carry out the study. In the first place he was able to draw on the wealth of documentation and historical material on nomads who have lived on the Russian steppes from the Scythians, through the Sarmatians, Huns, Avars, Khazars, Pechenegs, Turks, Polovcs, Tartars, the Golden Horde, to the Kazaks and others. The first Russian state in Kiev was destroyed by the Tartars in the thirteenth century, and in many ways the Muscovite state rose to prominence on the backs of nomad conquests, acting as proxy tax-collector from the Mongols to the steppes.

Professor Khazanov has never been allowed out of the Soviet-controlled world — he is not trusted by the authorities — but he has been able to visit the Central Asian republics and study the vast collection of materials in his institute. He has

combined this with an extensive knowledge of Western anthropological sources stored in the Lenin Library in Moscow.

Finally he has been able to draw on his own previous study of the Scythians, the early nomads mentioned by Herodotus in the fifth century BC. His book, *The Social History of the Scythians*, published in 1975 by Nauka, Moscow, has still not been translated, but its thesis is well known to Western anthropologists.

All this left him well prepared to undertake a major comparative study of nomads through history, and in the process allowed him to tackle the so-called nomadic question which has been causing controversy among Soviet scholars for more than 50 years.

The debate derives from the Marxist tradition which took root in Russia in the late nineteenth century, taking as its central theory a sense of historical evolution and development, which was to inspire all social and political thinking. The rival theory in Western anthropological and sociological circles was functionalism which took social cohesion and persistence as its central theme.

While functionalism has always been criticized for its inability to explain how social change takes place, Marxism has seldom been attacked for failing to explain the exact opposite problem — why stagnation takes place. Orthodox Marxist scholars, most notably Vladimir Lenin in a book published after his death in 1931, called *Mongol nomad feudalism*, had argued that nomads were an important element of feudalistic development. Pastoral nomads were thus a vital link in the historical chain from primitive and feudal society to socialist and communist society. Even Stalin in the 1920s had described Soviet pastoral



Nomads in Mongolia where Khazanov discovered stability and equality.

society as "patriarchal-feudal". A major challenge to this view was made in 1954 at an academic conference on the pre-revolutionary history of Central Asia and Kazakhstan. On the one hand, scholars led by Potapov saw nomads as displaying strands of primitive communism, patriarchal society, and feudalism. On the other, Tolybekov argued that nomads never reached the level of feudalistic operation. Two Soviet scholars have continued this latter tradition, G. E. Markov and Khazanov.

Markov, looking at Huns in the second and third centuries BC, the Mongols in the eleventh and twelfth centuries, and Kazaks in the middle ages, found little evidence of feudal relations among nomads. He was the result of the Tatars imposing their own rules on nomads, or Genghis Khan imposing his controls on the nomads. Nor did he find any evidence of class conflict, for example in the form of uprisings.

Khazanov's analysis shows that far from displaying the kind of "reputational characteristics" needed for orthodox Marxist theory, nomadic society displays both stability and equality, and great social participation. Also nomads exercise private

property rights over their herds, though they share communal ownership over grazing land. Simplified Marxist notions of base and superstructure do not fit easily.

His book arrives at two important conclusions: that the existence and functioning of nomadic societies depend not only on the outside world, but on a very specific relationship with settled, or sedentary, society which "allows nomads to go on being nomadic". Second, and devastating to orthodox Marxism, nomadic societies, ancient, medieval and modern, all seem to follow a cyclical and repetitive pattern of development, not a linear progression.

Khazanov's analysis, of course, may not have endeared him to the Soviet authorities. Moreover he has been active in Jewish circles, learning Hebrew, opposing the widespread anti-Semitism prevalent in the USSR, and involved in a study group trying to reconstruct the history of Soviet Jews. One interesting project he is following is the case of the so-called Khazar Jews, who managed to escape persecution from the Nazis by claiming non-Jewish ethnic antecedents linking them to the Jews. He was officially sacked from his institute, where he was a senior

research officer, after pressure from the authorities; interestingly the record shows that three members abstained from voting against him, itself a courageous risk, although the people told him afterwards that they had abstained. In any case he was immediately reappointed the next day at a more junior level and still does translation work for the institute.

About four years ago Khazanov, now aged about 50, applied for emigration papers. His request was refused and he was even told that he would never be allowed to leave the USSR, which is contrary to the Soviet constitution which grants citizens the right to leave. At the same time, by Soviet standards, he and his family have escaped the kind of persecution often faced by dissidents and reformers.

Professor Khazanov is, by all accounts, a very lively figure, a genuine intellectual in the East European tradition, the walls of his study lined with books, and filled with an irrepressible sense of irony. He once showed his contempt for Tchaikovsky by describing him as "a composer for hairdressers", while his book has occasional quotes from 1981 on the control of the past. No other anthropologist could quite have uttered all the different strands needed to produce such a comparative study on nomads, according to one anthropology professor.

Western anthropologists have not been slow to highlight his plight. His case was raised at an international conference on nomadism in Paris in 1976, to which he was invited but refused an exit visa by the Soviet authorities. Last year his case was again raised by the International Union of Anthropological and Ethnographical Sciences in Cambridge. The British Royal Anthropological Institute and Association of Social Anthropologists has also been pursuing Khazanov's case. He is of course continuing his work. But as another leading anthropologist says: "He is being deprived of his civil and legal rights and it will inevitably affect his scholarly output."

Paul Flather
Nomads and the outside world by A. M. Khazanov, price £37.50 published by Cambridge University Press.

Pauline Stafford



The road to Wigan Pier: journey into the unknown

Summer is the time for journeys. Its onset has the feet tingling and the prospect of a few leisurely weeks closes the study door and brings out the packs and cases. In these days of academic austerity a short hop to the east coast may be more likely than lengthy meanderings towards the sunny south, but however short the journey its preparations bring that same sense of excitement and apprehension. Whether we are poring over the Michelin guide or the Ordnance Survey map of the South Pennines the tension mounts at the prospect of the unknown, the unexplored.

The challenge and potential of the unfamiliar must go a long way to explain why the journey or voyage is one of the oldest and most perennial of literary genres — a genre not to be confused with the purple-prosed voyeurism of the modern travel book.

The itinerary may be one of marvels after the fashion of *Odyssey* or taking us into a strange Atlantic seascape on the miraculous voyages of the Irish saints, emphasizing the journey as a decisive step out of the patterns of everyday life. It may be a pilgrimage to the shrines of the faith or a quest for the grail, an allegorical journey through the moral landscape of a pilgrim's progress. It often involves the theme of exile and through exile of discovery whether of soul, of self or of society; Wilhelm Meister taking the path of the early Romantics or William Morris travelling up the Thames to bring back News from Nowhere.

Like travel itself the journey as literature is a distancing even a disorientating genre, carrying the threat as well as the promise of self-revelation, even of self-enclosure (northerners on the south-bound train to London never look more conscious of or defiant in their provincialism). In the nineteenth and twentieth centuries the journey has been adapted as a literary form for social comment, an exploration of the hidden lands of our own society. In such a spirit Orwell set out on the road to Wigan Pier, and with such a view Beatrix Campbell set out on her bicycle in 1982 to retrace his footsteps. But the profound potential of the genre made her *Wigan Pier Revisited* more than a voyage into darkest Britain and back again. It was a pilgrimage around the myths and shrines of the labour movement and a personal *Odyssey* of a socialist feminist in search of God.

A journey through late, twentieth-century Britain is more a chronicle of horrors than a voyage of marvels. Food is a counterpoint to all literary voyages — an extended development of the logistics of the sandwich pack or the motorway cafe. Lavish feasting in comfortable halls, landings on islands of plenty which flow with milk and honey punctuate all these quests which are probably why *Odyssey*, like Dickens, make poor bedtime reading for those who suffer from night starvation. Food is a theme if not an obsession of Campbell's journey, just as it is an obsession of the homes of the poor where she stayed. Life on the dole is summed up in an endless diet of beans on toast; fishfingers and chips populate the monotonous gastronomic landscape; moonlighting now means a man in his thirties frantically buying a bag of potatoes and then selling half of it; the possession of their boarded treasure should mark him out to the snooters.

Her journey was a pilgrimage in

which the old myths and shrines of the labour movement were visited and in some cases found wanting. The miners still respected as the spearhead of a movement which gloried in the name and the image of physical labour, proved an ambiguous symbol for a feminist. They are shock troops, but of a masculine dominated ideology, an essentially male stereotype. Her faith has new martyrs — the miners' wives, who have always been the unseen support of their menfolk but whose presence in their class and community has long been ignored by conventional politics.

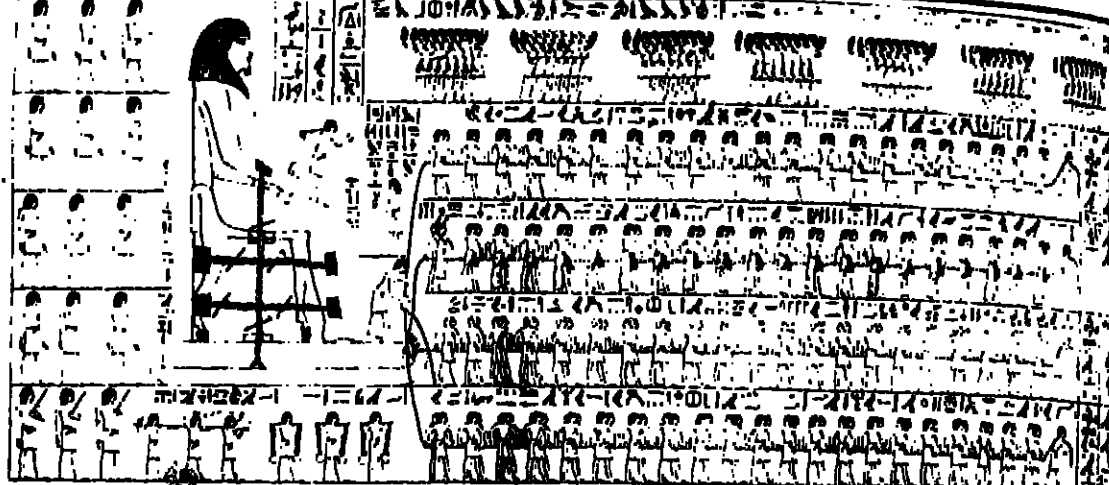
Beatrix Campbell's rediscovery of them is pointed up by the current dispute where the role of women and community in providing the solidarity which sustains the strike is manifest. The new saints' lives will become the reminiscences of cooperative working women, collected by Margaret Jewell Davis, where struggles for pithead baths take their rightful place alongside apparently more momentous changes in conditions.

There is even an enchanted garden in this *Odyssey*. Campbell was beguiled by the discovery of an enclosed oasis of trees, blooms and benches in the desert of a council estate. The spirit of the quest as a search for truth burns strong and she candidly admits that it is an island of private ownership in a corporate sea; but it is filled by the communal effort of a group of neighbours, a veritable Eden of fraternity. It is in such spontaneous organizations of women, of tenants' associations, of refugees for battered wives, that the new vitality is found. Like so many feminist Campbell has drawn great personal satisfaction from the emotional ties and support of women's groups and her labour movement, like her perspective on its history, has found its strength in that same warmth. With her contemporary commentator on the world of the modern poor, Jeremy Seabrook, she sees fraternity not hatred or class envy as the ubiquitous and strongest bond. Their own

origins among the people whom they describe have produced a deep empathy. Equally they have found the grail which they sought.

Such old legends remain, may even be rejuvenating in the soup kitchens of the miners' strike, but this voyage shows the inadequacy of the old folk wisdom of the poor and the resulting sense of bewilderment and frustration. "Every man should have a trade in his hands" and our grandfathers pushed their sons in the appropriate direction. Skill was a guarantee of a stable future, of a job, if not of one's life, and of a decent standard of living, of all the aspirations. Beatrix Campbell's mile con-temporaries became druggists, drawing and designing those machines with which they developed a relationship torn between hatred and love. Yet these are precisely the jobs which the new generation of machines have replaced. If the age of steam mechanized muscle the age of the chip has mechanized skill and a bewildered working-class elite has found little alternative between Luddism and the dole.

The most remarkable thing about the modern poor is their invisibility. Fragmented and isolated by the very mechanisms of the dole cheque they scarcely feature in the landscape. A journey into their Britain is a disturbing journey into an unknown land for most of us. Fortunately there are still some able to get on their bikes and undertake it for us.



Egyptian slave labour eased by tribological application in 1900 BC

Ay, there's the rub

John Halling considers the science of tribology

The word "tribology" was created for a Ministry of Technology committee in 1966. A literal translation would be "the science of rubbing". It is more formally defined as "the science and technology of interacting surfaces in relative motion and the practices related thereto". That may sound like a classic definition of sex; the actual subject deals with all aspects of friction, wear, lubrication, contact mechanics and related phenomena.

The outcome of the committee on tribology (usually known as the Joint report) was twofold. In the first place, the introduction of a word defining the problem has brought into play a unifying influence for engineers, chemists, physicists and metallurgists who had previously been concerned with solutions (in fields like lubrication engineering). Then, and more significantly, the committee showed that poor tribological practice was costing this country many billion pounds per annum in today's costs. Reducing friction saves energy; reduction and control of wear leads to greater reliability and longer life. Some degree of corrosion or wear, so-called planned obsolescence, is built into all mechanical systems (indeed the very concept of planning implies some form of control and limitation) but this in no way diminishes the importance of tribology. Many other countries have since adopted the British initiative and formed their own national tribology groups which are now members of the International Tribology Council.

The steel, invented more than 6,000 years ago, is a well-established tribological device and clearly demonstrates the antiquity of the subject. Throughout recorded history there are many examples of human involvement with tribological problems. Ancient Egyptian illustrations — dating from nearly two millennia before Christ — show massive statues being dragged by an army of slaves. Careful examination reveals an early student of tribology standing on the base of the statue pouring a liquid on to the path of sliding. Equally interesting is the fact that if one estimates the weight of the statue and the pull of the friction, one obtains a coefficient of friction about the same value as one obtains in the laboratory for water lubricated wooden contacts. Modern tribology therefore validates the accuracy of the picture with respect to the number of slaves, an interesting demonstration of the reliability of the artists of the time.

Every aspect of daily life brings us into contact with tribology. Even lying in bed, the feel of sheets, cotton, linen, silk, is a tribological phenomenon. Stretching the limbs involves tribological behaviour in the joints. Cleaning the teeth is a controlled wear process, washing, shaving, holding things, using machines, walking, all identify the subject as one of universal concern. Needless to say, most tribological research is concerned with its industrial significance.

The two immediately evident effects arising from contacting surfaces in relative motion are friction and wear. Using these two categories we can identify several types of tribological problem. For devices such as brakes and rope drives, wheels/rails and wheel/road contacts, even the humble nut and bolt, we require high friction with minimum wear. For cutting tools, we require low friction and wear of the tool, though wear of the product being tool is often unimportant. Indeed, in abrasive processes such as filing, grinding and the like, wear of the product is the very objective of the process.

In an industrial context, the designer must choose materials to satisfy particular tribological needs. There has

been an increasing use of polymers in contact with metals; many examples are to be found in cars and other everyday machines. Such combinations are also used in artificial human joints for the relief of arthritis. Materials like polymers cannot operate at high loads and/or speeds and other solutions must be found. In some instances, a thin surface film of an appropriate material solves the dilemma; the use of soap to ease a saw or a sticking drawer is a simple example of the principle. We also use additives to lubricating oil to inhibit metallic contact during the start of engines and films of graphite and molybdenum disulphide in other applications.

The ideal way to prevent the interaction of two surfaces is to separate them by a continuous film of fluid. Such a fluid must of course be able to carry the applied load without being displaced from the contact. This requires that such films must be pressurized. The hydrodynamic or self-acting bearing draws fluid into the gap between two solid surfaces where pressure is generated by hydrodynamic action. Alternatively, one may produce pressure in a fluid film by connecting it to an external pump, the so-called externally pressurized or hydrostatic bearing. Although mineral oils are the most extensively used fluid in such bearings they may be designed to operate with other fluids. Today, one increasingly finds the very cheap fluid air being used in bearings of both types. Every one is nervously familiar with the high speed dental drill which uses externally pressurized air bearings and similar bearings are finding increasing industrial applications.

The use of rolling elements to separate moving surfaces is well established in all forms of wheels and in rolling element bearings such as ball bearings. Finally, the separation of moving surfaces by forcefields is a limited but valuable tribological solution. The use of magnetic fields is well-established in such devices as electricity meters and other applications are now appearing. It is perhaps necessary to stress that the foregoing tribological solutions may be used in appropriate combinations for a given design situation. Thus in automotive bearings using hydrodynamic fluid films, one invariably finds additives which form protective surface films to prevent metallic contact during the start up before the full fluid film has been generated by hydrodynamic action.

In practical terms, the progress of tribology can best be demonstrated by the performance of our cars. The tyres travel at higher speeds, provide better traction and braking and yet last at least twice as long as they would have done 30 years ago. In the same period, the car engine has increased in power without increase in weight, has considerably reduced its fuel consumption and now has a life three times longer than its predecessor. Two other fields seem worthy of special note. In the hostile environment of nuclear reactors and in space technology tribology is a critical technology. Progress has been made in nuclear reactors, the special problems of tribological operation in atmospheres of hot carbon dioxide and in liquid sodium have been

solved by careful choice of materials; liquid sodium has been used ingeniously as a "lubricant" in externally pressurized bearing designs. In space applications such as satellite bearings, where liquid lubricants would evaporate in the vacuum of space, the use of soft metallic films in rolling bearings is now successfully employed.

There can be little doubt that the past 20 years have seen considerable improvement in tribological practice although much remains to be done. One of the primary reasons for improvement has been the application of academic research to industrial problems by bodies such as the centres of tribology. These were set up in the 1960s at Leeds, Swansea and Rile and have close collaborative contact with their associated universities. The National Centre of Tribology at Rile also contains the European Space Tribology Laboratory. These centres operate as tribological consultancies and training agencies for industry, as does the Engineering Science Data Unit, which provides much valuable design data.

It would be inappropriate to pass over the most recent developments. During the past decades processes have been developed for the deposition of highly adhered surface coatings deposited from the vapour phase to combat corrosion and wear and to control the frictional properties of surfaces. Such processes depositing films of ceramics just a few micrometres thick are already increasing the life of steel cutting tools by several hundred per cent. The plasma-assisted vapour deposition processes developed at Salford University, often called ion plating, have already found many new applications, some of them now commercially available. For the first time, designers may choose the bulk material of engineering components to carry loads and then choose the surface material to deal with problems of corrosion, friction, wear and total life. Systems theory is concerned with any object or study made up of a number of interacting components which form a more or less coherent whole. It is concerned, therefore, with complexity, with the behaviour of such systems and their control.

As a discipline, the history of systems theory illustrates many of the problems of the management of innovation within academic structures. It has origins in a certain style of biological research in the 1930s. It took off in a number of more practically-oriented directions following the development of computers in the 1950s (coupled with an impulse stemming from research on a number of large operational problems during the Second World War). But it has never managed to establish itself firmly as a university discipline. There are very few whole departments devoted to it (whatever the name) though there are bits and pieces in most universities scattered across a variety of locations. There are many reasons for this. First, it claims to take any system of interest as a subject of study, and this means that other subjectively-defined disciplines feel threatened by it. Secondly, its scale of interest is the opposite to that which drives most disciplines and concerns with complexity inevitably leads to the formulation of its practitioners to these kinds of considerations has led to its identification to the abandonment of its original objective.

A school of thought has stuck with the prime goal — to analyse large systems and to focus on the model of and abstract mathematics which the problem application but which in practice stops short of solving any interesting problems. The opposite route more closely associated with labels like "systems analysis" involves defining problems which are simpler and therefore solvable with certain distinctive methods. This field of activity is useful and is expanding rapidly in

A new image for film

The time is fast approaching when feature films on video will be as cheap to buy as paperback books, so cheap that they will be little excuse for not giving film studies a more substantial role in university arts courses. Students will not only have Penguin Shakespeares on their shelves but KMT Fritz Langs too. The last snag is the tiresome matter of copyright. When parliament debates this very issue in the autumn we may see the beginning of the end of what has recently been a major hindrance to the study of film in institutions renowned for irreproachable and scrupulously legal habits of mind.

Copyright is the last in a long series of skirmishes film has been engaged in over the years. The legend and most draining was over its academic respectability. With perhaps only hearsay knowledge of Hollywood's back work, film's detractors would dredge up mighty but by now mercifully anachronistic idealist critiques. These were based on the lurid notion that popular culture, rooted in industrialized values, could only be expected to peddle sterilized, dehumanized indignities to a populace largely predisposed to sampling solely dehydrated forms of art.

Stuffy dons have rarely been alone in recollecting with horror and repugnance from film. Buñuel writes in his autobiography that his mother wept with shame on learning that he intended to earn his living in the cinema.

But monastic voices in defence of spurious notions of intellectual purity are now more usually drowned by those of a largely saner majority increasingly recognizing that students can learn as much from *The Lady from Shanghai* and *Los Olvidados* as from *Great Expectations*

and *Macbeth*. Venerable literary texts are the yardsticks by which some still insist on judging film's artistic merit. But, as everyone knows, the artistic merit of these texts is sometimes inseparable from the "popular" contexts in which they are frequently rooted. As film gains respectability it is sobering and faintly depressing to reflect that the names of Howard Hawks and Alfred Hitchcock, in controversy "popular" artists, will be pronounced in the hushed tones sometimes reserved for, say, Shakespeare.

Nowadays, of course, though we still worship greatness, distinctions between high and low culture have grown narrower. High and low have been corseted together to reduce the invidiousness of the comparison, and the healthier, more rewarding approach lies in a complicity to regard all culture as worthy of interrogation.

We might, in the end, indeed want to devote more time to *Don Quixote* than to the Esther Williams' classic *Million Dollar Mermaid*. But on the other hand *Shadow of a Doubt*, Hitchcock's study of a psychopathic malcontent, will detain us longer than, say, *Salut Joan*, a text whose avuncular tone has not been unknown to induce tedium.

As art theory has taught us how to uproot prejudice over popular forms, we have simultaneously learnt how to recognize the extent to which all art, high and low, is as vulnerable to ideological predators as it is susceptible to the processes of genius. In most university literature tutorials, questions about the radical, patriarchal, anarchic, reactionary, or religious attitudes of the author are no doubt constantly being asked. And the more these

questions are answered the greater the chance of what Barthes has called the author's death.

It is increasingly legitimate to argue that the text is not quite the exclusive property of the aloof, self-contained author, and a little more than might have been suspected the product of the intersecting values and beliefs of the age in which he or she lived and worked. Ever since the explosion of structuralism in British universities such views have gained increasing credibility, but before anyone ferociously repudiates their "sociological" perspective it is worth recalling that even such esteemed pre-structuralists as Virginia Woolf and T. S. Eliot had noted the indivisibility of art and ideology.

So, ignoring the probably fruitless topic of the search for distinctions between high and low art, film tutors ask: why and for whom are films made? What are they? What do they tell us about ourselves, about the times they were made in, the culture that produced them? In order not to be distracted by the solemnity of these questions we must, as Christian Metz, doyen of film theorists puts it, both love and not love the film object. The film itself will usually conspire to make us love it, accept it on its own terms, but we must learn how to resist its more enslaving seductions.

Not to do so entails pondering to the film's creators, elevating the work on to a pedestal and aping the custom of some literary critics and tutors celebrating the great tradition of English, American or European authors. But, taking proper precautions one can quite legitimately reformulate a Renaissance ideal: that to see films well is to live well.

Now that fewer academics hold



Singin' in the Rain: self-conscious commentary on form?

their noses at film there really is no need to do a Leavis — in a positive sense — on the subject. We can scrutinize films, as we also must literary texts, not only with love for their undoubtedly exquisite sensuous and intellectual pleasures, but also with analytical sobriety. We are ready to probe dispassionately the sources of our pleasure, to recognize the collaborative nature of film art and to ground discussions of form in the contexts of history and culture.

But, as film is still in some senses the Shylock of arts subjects, it is worth asking, for the satisfaction of lingering sceptics, whether if pricked, it too like great literature would not reveal examples of extraordinary narrative complexity (the flashback structure of *The South and Letter from an Unknown Woman*); the marvellous patterns of interconnected puns on "babies" in *Double*

Indemnity; of dense and reverberative allusions (to Gothic art in *Spirit of the Beehive*, to the history of American film in *The Long Good-bye*); of *mise-en-scène* (the visual and verbal Chinese box structures of *The Searchers*); of self-conscious commentary on form; of questions relating to problems of realism and the conditions of illusion (deep-focus techniques in *Citizen Kane*; religion (Old Testament sin and guilt in *Marnie*); role and gender (the voluptuous *femme fatale* played by Rita Hayworth in *Gilda*, the transvestites in *Some Like It Hot*); and humanity (the vision of small-town pastoral in Rouben Mamoulian's *Summer Holiday*). Welles' *The Magnificent Ambersons* would alone satisfy the cravings of the severest textual scholar.

Peter W. Evans

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Organization on the brain

Alan Wilson looks at how systems theory can be made more interesting

parallel with computer use. Academically, however, it has not been substantial enough or strong enough to create its own departments. Stafford Beer has followed a small number of distinguished practitioners like Warren McCulloch and Ross Ashby who managed to steer an inbetween course: to remain firmly focused on complexity; and not to simplify the problem in such a way that it becomes trivially solvable and thus, from a research point-of-view, uninteresting. He has invented a method which offers deep insights. And this is another explanation of part of the academic response: this kind of method involves what is usually taken as an academically unrespectable form of argument — learning in the first instance from an analogy.

The basis of the analogy, which I found startling when I read the first edition of *Brain of the Firm* in 1972, is the human nervous system. The justification for its turns on the concept of viability. Beer argues that an interesting feature of a complex system is the way it is organized to ensure long term viability; and that a successful system should, on the basis of analysis, be seen to have certain desirable features. The argument of *Brain of the Firm* is that one of the most successful systems ever to evolve in nature is the central nervous system of the human body, and that this therefore provides a good model for wider uses. I was staying in Cambridge when I first read his account of the brain and its operation as a control system. I was so impressed that the first thing I did was to take myself to the university library to see if this first claim to take any system of interest as a subject of study, and this means that other subjectively-defined disciplines feel threatened by it.

By Stafford Beer, its scale of interest is the opposite to that which drives most disciplines and concerns with complexity inevitably leads to the formulation of its practitioners to these kinds of considerations has led to its identification to the abandonment of its original objective. A school of thought has stuck with the prime goal — to analyse large systems and to focus on the model of and abstract mathematics which the problem application but which in practice stops short of solving any interesting problems. The opposite route more closely associated with labels like "systems analysis" involves defining problems which are simpler and therefore solvable with certain distinctive methods. This field of activity is useful and is expanding rapidly in

be seen as a "big switch": it controls the flow of information in both directions — downwards to pass on "commands", upwards by way of report. The upward messages include the data on the kind of resource Beer suggests. The "divisions" in the hospital sector are obviously the specialities which provide the basic services. Each of these is managed by one or more consultants whose decisions are based largely on clinical information and who are largely unconnected with higher management. But the most striking feature of the system, if one begins to think about system four, is that because of the way accounting systems were devised, we do not even know the costs of running divisions (specialities) relative to each other. And other information gathering functions are scattered within a health authority.

So far, so good. But now comes a remarkable conjecture: the analogue of system four, which is necessary for viability and effectiveness, is missing from the management of this, we need to interpret the significance of some typical examples. We can follow Beer and start with the firm. It will typically have some more or less autonomous divisions each headed by a senior manager. There will be channels of communication between these divisions and some sort of coordination which maintains the activity of the firm according to an overall policy. This policy will be decided by the main board of directors who constitute level five. System four, if it exists, will be some kind of development directorate — appraising and evaluating current activities, keeping tabs on new trends in the external environment, putting up alternatives for future policy changes. More likely, these functions will be dispersed around other units within the organization.

A missing system four may not be serious in the short run: the autonomic system will keep the firm going perfectly efficiently. But the environment of the firm is not constant: there will be technological development, new competitors with cheaper processes, products become obsolete. Without a system four, information will be received by the board only at a time of crisis, and then too little and too late.

We can now have a lot of fun, and gain a lot of insight, by trying to apply these ideas to other kinds of organizations. In my own university a few years ago, I once tried to create a rudimentary system four (without calling it that!) by suggesting in planning committee that one of a number of available research assistant posts should be devoted to gathering and processing information which might be relevant to the longer term policies of the committee. My colleagues were quick to hear out another of Stafford Beer's

conjectures: there were, they argued, many more basic jobs to be done in departments — the proposed system four post looked like a non-job. It isn't: the information gathering and filtering job is vital.

Can we now change tack and generate any useful conjectures about health service planning and associated research programmes? At a general level, I get some reassurance because I am trying to develop information systems and to study how they can be used. Definitely system four research! But the analytical task is difficult, and implementation even more so, for all the kinds of reasons Beer suggests. The "divisions" in the hospital sector are obviously the specialities which provide the basic services. Each of these is managed by one or more consultants whose decisions are based largely on clinical information and who are largely unconnected with higher management. But the most striking feature of the system, if one begins to think about system four, is that because of the way accounting systems were devised, we do not even know the costs of running divisions (specialities) relative to each other. And other information gathering functions are scattered within a health authority.

As with some of the firms mentioned earlier, the deficiencies of this system have not mattered too much provided the budget was growing every year. Specialities could function autonomously. But now, as is well known, near-crisis conditions prevail in many authorities. The Department of Health and Social Security has made one move in the right direction by publishing and continuing to refine performance indicators.

Beer shows quite convincingly that team management is essential to minimize the probability of really poor decisions being made. A single top manager cannot possibly handle the quantity of information relevant to decisions which he or she ought to be making. As he puts it: "Unhappily, the directors at . . . group level are still constrained by the three-pound computers in their skulls . . . If a scientist were to arrive from Mars and study our organization charts, he would inevitably conclude that the managing director of the corporation had a brain weighing half a ton". So even when general managers are appointed, research will continue on information generation and flow and on management structures.

A final thought on academic organization: I return to the points that not only have universities and other institutions of higher education failed to take any notice of the ideas offered by systems theorists in their own planning organization, but they have also failed to develop academic curricula and structures in such a way that these ideas can be taught more widely. Somehow we must discover ways of avoiding throwing out the baby with the bathwater and of absorbing, at least for further testing, some ambitious and unconventional ideas.

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BOOKS

Caribbean colony

by Laurence Whitehead

Puerto Rico: a colonial experiment
A Twentieth Century Fund Study
by Raymond Carr
New York University Press, \$32.50
ISBN 0 8147 1389 0

In 1898, asserting its presence for the first time as a world naval power, the USA seized Puerto Rico, Cuba and the Philippines from the faltering Spanish empire. The subsequent history of these three peoples represents some remarkable contrasts.

Cuba was far larger and more prosperous than Puerto Rico. Never formally a colony it was subjected to a form of government that had an appearance of autonomy but that, in reality, was highly circumscribed by US economic, strategic, and political requirements. With "normal" politics thus discredited the stage was set for the Cuban revolution of 1959, as the only way to establish "true independence" from the colossus of the North. The Philippines put up more resistance to the US occupation, and was subjected to forty years as an American colony, followed by a Japanese occupation. Only after the Second World War, as the USA urged decolonization on the old European empires, did the government in Manila achieve formal independence. Yet since then the Philippines has remained in a relationship of close alliance and even to some extent of neo-colonial subordination to the USA, like Cuba before 1959. Even now it faces some of the same risks of eventual rebellion.

Only Puerto Rico, the smallest and poorest and least "desirable" of the three territories, remains without the trappings of political independence. Puerto Ricans have never fought against the US as Filipinos and Cubans have done. On the contrary as US citizens since 1917 they have fought for America in every war since the defeat of Spain, and 94,000 veterans constitute a powerful and privileged lobby within an island of three million. Any anti-American tendencies within the Puerto Rican political elite have always had to contend with a strong popular sentiment favouring the colonizers.

Yet curiously what the United Nations regards as the USA's last major colony has rather successfully asserted its separate identity – perhaps more successfully, in vital respects, than the independent Philippines. Thus, for example, the Americans succeeded in substituting English for Spanish as the language of government in Manila. But in San Juan a determined and sustained effort to force English on the population via the colonial school system was decisively defeated. Nowadays a major obstacle to the full incorporation of Puerto Rico into the USA (say as the fifty-first state) arises from the failure of this linguistic aggression, and from the cultural resistance it has engendered. It is this aspect of twentieth-century Puerto

Rican experience that is most emphasized by Raymond Carr, the distinguished historian of post-imperial Spain who was chosen by the Twentieth-Century Fund to write a fresh interpretation of the island's predicament.

As inhabitants of an unincorporated territory these American citizens are in a perpetual quandary about their true status and legal rights. Yet they have also obtained some remarkable political advantages that many neo-colonial peoples would envy – a say in the selection of US presidential candidates, a stable and well-functioning party and electoral system, a degree of security and personal freedom under the law that is more than rare in the third world. The economic advantages of colonization are no less striking. Professor Carr estimates that \$50 billion has been transferred from the mainland since the 1940s (over \$15,000 for each inhabitant on the island) with a commensurate impact on living standards and on the pace of industrialization. Most prized of all, Puerto Rico enjoys unrestricted free access to the US labour market. The price of these not inconsiderable advantages has been a "loss of dignity", a sense of insecurity about Puerto Rico's national identity and its eventual future, intangibles that are hard to balance in any rational calculus against the pragmatic benefits offered by the status quo. The current of irrationality that runs through all discussion of the status question derives precisely from the feeling that certain questions of identity are beyond all price.

Professor Carr's wide-ranging study contains the provocative subtitle "a colonial experiment". Both the UN Decolonization Committee, and much of the intelligentsia of the island (who form the core of the independence movement there) will welcome such frankness of language, which runs counter to mainstream US opinion, and which must deeply mortify one of San Juan's three main political factions. For over a quarter of a century Puerto Rican politics were dominated by Luis Muñoz Marín, the first elected Governor and darling of the American liberal establishment of that era (also a trustee of the Twentieth-Century Fund which commissioned this study). It was his life's work to deny and disguise the colonial basis of the island's ties to the mainland, and it is the ultimate failure of his enterprise that provides the focus of Carr's study. Oddly enough much of the book offers a highly favourable view of Muñoz Marín's purposes and achievements, although withholding the essential accolade.

Professor Carr admits to the many awkward and embarrassing colonial vestiges that Muñoz Marín wished to obscure, and concedes that these do indeed give rise to an unhealthy and endless obsession with the status issue, but seems to argue that this variant of colonialism is no cause for shame, for, as he makes very clear, the alternatives (to enter the union, or to move to full independence) are both fraught with danger. The status quo may be illogical and even unjust. So was that of Northern Ireland from the twenties to the sixties, but as Ulster in the seven-

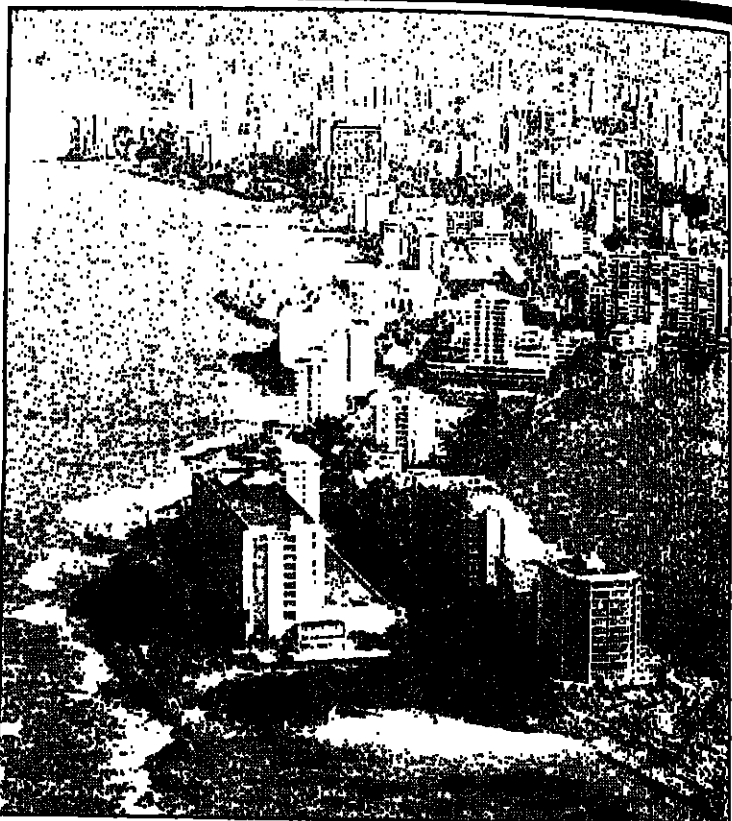
ties demonstrated only too well, all sides could lose from an attempt to impose logic and justice where no consensus exists on the bases for a permanent settlement.

This may be a fair summary of the author's basic standpoint on the status issue, but his study contains so many undercurrents, and views each topic from such a variety of angles that it is quite difficult to be entirely sure. What does emerge very clearly is that, in contrast to his fair-minded treatment of the strengths and weaknesses of the proponents of staidness, the author displays a strong sense of hostility towards the advocates of full independence. As an accomplished and subtle historian he shows considerable understanding of their motivations and of the complexities of their position. (In fact his chapter on the independence parties is the most perceptive and coherent in the book). But having understood them so well, and having accepted the "colonial" designation that they promoted against such intense resistance during Muñoz Marín's heyday, he proceeds to lose all patience with them. They are guilty of "virulent anti-Americanism", they use far-fetched alibis to conceal the fact that they can never win the people of Puerto Rico to their side, their economic policies are a recipe for disaster, and they completely misjudge the interests and purposes of the nation from which they wish to free themselves. The breadth and intensity of this attack is difficult to reconcile with the ostensible message of the book. Are these the reflections of a dispassionate observer or the sentiments of someone caught up in the island's passionate controversies?

The key issue of course is not whether this study is passionate, but whether its assault on the *independistas* is well-founded. As a professional historian Carr is obliged to resist their mythologizing of history, and as a shrewd contemporary observer he is right to point out the inconsistencies and concealed premises of their arguments. But does he go too far in his case could have been made for them than they have made for themselves. A detached British observer, conscious of the psychological consequences of island existence, and drawing more systematically on the lessons of Irish history as a clue to the Puerto Rican predicament, might have offered them more positive advice and more friendly encouragement.

Carr refers to Puerto Rico as a "Caribbean ministe", although it has almost twice the population as El Salvador, and is not much lower a standard of living. He uses expressions like "thing" to refer to the island, and in fact the island's poets, scholars and artists compare favourably with the intelligentsia of many American states, and in any case, few observers would any longer adopt such a patronizing tone towards the cultural achievements of any comparable European people.

The claim that independence would necessarily be an economic and social disaster for Puerto Rico rests on the assumption that it must take the form



High-rise hotels in San Juan, Puerto Rico.

of a tit-for-tat breach with the USA. In the 1930s, Senator Tydings persuaded Washington to offer a form of independence so punitive that Muñoz Marín gave up the struggle, and in 1946 the Philippines paid a high price for its freedom, but nowadays more constructive formulas can be envisaged that might eventually win American acceptance. After all El Salvador achieved political independence from Britain while preserving unrestricted access to our labour market (no passport is required to cross the Irish Channel) and, for over fifty years a virtually common currency. Once independent the Irish were no longer required to fight in our wars, nor did they impose a burden on our exchequer. They have been neutral (but not threatening to our security, interests) and free to devise laws that suit their own national needs and inclinations. An independent Puerto Rico modelled on these lines could be a viable alternative to the existing condition of constitutional limbo. It could have attractions both to Americans and to Puerto Ricans alike.

The one really serious objection is that the net transfer of federal funds (which reached 31 per cent of the island's gross product in 1980) could suddenly dry up, producing severe dislocation of the island's economy. Yet it is hard to believe that transfers on this scale will be sustained even in the absence of independence; a phased reduction is in any case under way because of Reagan's expenditure cuts; Reagan's tax cuts and "one way free trade" measures have also reduced the economic advantages of remaining a colony with exclusive exemptions; and an independent Puerto Rico which retained good relations with the mainland and reasonable access to the US market could with time apply its acquired skills and infrastructure to

the creation of a more autonomous structure of production. (El Salvador, for example, has made itself a favoured location for Japanese companies seeking access to the EEC.) All in all the "unthinkable" notion of an independent Puerto Rico could have more to recommend it than either the *independistas* have been able to articulate or than this severe critic has been willing to recognize.

Despite all this the electorate of Puerto Rico might still prove hard to persuade. Indeed some of Carr's most persuasive evidence suggests that they might hold out for staidness. They might even persuade the American political establishment that their commitment to this cause was determined and widespread, and so would have to be honoured. (Although I suspect that it will prove far harder than most statehooders imagine to overcome American resistance once a serious push for incorporation was launched.) Is the USA likely to grant to poor and Spanish-speaking Puerto Rico what it persists in denying to the more prosperous but mostly black District of Columbia? But one defining characteristic of a colonial situation is that once the metropolitan elite starts to reconsider its assumptions the attitudes of the colonized may rapidly become "unblocked" (as we may soon witness in Hong Kong). This fascinating and challenging interpretation of Puerto Rico's history and prospects was commissioned because thoughtful Americans are becoming more willing to reconsider their assumptions about their Caribbean colony. But in the last analysis Professor Carr has chosen to vindicate the past rather than to entertain the possibility of a more authentic future.

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BOOKS
Locke in context

Locke
by R. S. Woolhouse
Harvester, £22.50
ISBN 0 7108 0433 4
Locke
by John Dunn
Oxford University Press, £7.95 and
£1.95
ISBN 0 19 287561 2 and 287560 4

It is a strange but common assumption that anyone writing about a great philosopher of the past faces the straightforward choice of treating his subject as if the latter were a professional colleague writing a philosophy textbook now, or of failing to relate (let alone vindicate) his subject's philosophical concerns to those of the present day – and that the former is always preferable.

This thought embodies the arrogant and philosophical concerns are the only ones that could possibly interest us (or, even more outrageously, the only proper concerns). Moreover, it relates the two enterprises of doing philosophy and doing the history of philosophy in utterly the wrong way, appearing to regard them as necessarily inimicable to each other: we can undertake one of these enterprises, painstakingly considering the meaning (say) Locke's words in the wider context both of his own aims and of the intellectual currents and debates of his own day (and be "mere" historians), or we can take the texts at their first-blush value and do philosophy with them. But why can't the product of the first enterprise be useful in the second, and indeed, how can someone who claims to be using Locke's account of a given philosophical topic rationally ignore the historical nature of his claim?

Locke has been better served in this respect than many of the other great dead philosophers; but it is none the less good that two recent introductory books on Locke, by John Dunn and R. S. Woolhouse, continue the promotion of this juster attitude. Woolhouse's book is a basic introduction (presumably for first or second-year students) to the major theme of Locke's *Essay*: Woolhouse concentrates, reasonably enough, entirely on Locke's theory of knowledge; he does not concern himself at all with Locke's moral and political philosophy, his philosophy of mind, his influential views on language, nor with his treatment of particular ideas such as those of identity or power. His aim is to make sense of the *Essay* as a whole by explaining how it answers Locke's central purpose – "to enquire into the Original, Certainty, and Extent of humane Knowledge; together, with the Grounds and Degrees of Belief, Opinion, and Assent" – and by making clear something of the intellectual context in which Locke's question, and his answer, were formulated.

Woolhouse's aim and general strategy are excellent, but his tactics are not always the best. In particular, he expounds the intellectual background to the *Essay* piecemeal, as the needs of his exposition appear to demand; this leads to obscurity (and sometimes to confusion), and I think that the more humdrum approach of setting the stage of Aristotelianism, Boylean corpuscularism, and so forth right at the outset would have been preferable. He should also have included a discussion of the nature of ideas – the dismissive account on page 47 is inadequate for the book's intended audience. Woolhouse's exposition is obscure at other points too – most importantly, perhaps, in his handling of the Strassbourg clock example when explaining Locke's distinction between real and nominal essence in chapter 11. He gives the impression that it can be taken for granted that the expert on clocks actually knows the real essence of the Strassbourg-type clock (and again, that the clock's mechanism is its real essence); this confusingly changes the point of Locke's example, and either misrepresents Locke's actual position, or at least glosses over the controversial issue as to how far (if at all), in Locke's view, good scientific hypotheses could be thought to approximate to the truth about real essences. These complaints apart, Woolhouse's account is sensible and useful.

The power of thought

Thinking Matter: materialism in eighteenth-century Britain
by John W. Yolton
Blackwell, £19.50
ISBN 0 631 13335 6

Most of the great problems in philosophy have a long history and most of the basic lines of argument concerning those problems are associated with great names. The debate on the nature of the human soul is perennial, but modern discussions of materialist theories of mind usually take place virtually without reference to anything written before Gilbert Ryle's *Concept of Mind*. The purpose of Professor Yolton's very useful book is to introduce philosophy to the controversy about materialism as it occurred in England during the eighteenth century. Locke suggested that God could add thought to matter if He so wished. This suggestion was seen as opening the

way for materialism and for an attack on religion and morality. It portended materialism because if matter could conceivably be given thought by God, then would it not follow that it might conceivably possess a natural power of its own to generate thought? And it threatened religion and morality because if thought could belong to matter then there need be no immortal soul in man and hence nothing which could survive death and face judgment.

The ensuing controversy was concerned principally with whether matter could bear such a property as thought and, more generally, with what the natural properties of matter are. The classic corpuscularian conception is that matter is inert except for the ability to transmit motion which it receives from elsewhere. Any further properties of mind usually take place through the intervention of some divine attraction and (if possible) thought could only belong to it by special divine intervention, as did the original motion. But whereas motion is not contrary to the essence of matter, thought, anti-Lockeanly argued, is; so not even God could make it a property of matter. During the eighteenth century the concept of matter developed, so that it was no longer thought to be

political interests to the exposition of his moral and political philosophy. Dunn writes in a clear and engaging fashion, and gives us a good picture of Locke the man as well as of his ethical views. To this extent the book is successful; but it does not achieve Dunn's avowed purpose in focusing solely on Locke's moral and political work – to convince us that Locke is a "master". Dunn hopes to demonstrate Locke's greatness by charting his major failure – namely, his failure to achieve a rational vindication of his belief that there are fully determinate political and moral principles derivable from reason. But failures, however "resonant", in Dunn's phrase, only intimate a thinker's greatness if he makes an illuminating intellectual response to them. That is why the realization of the impossibility of constructing a rationalistic political theory out of "God or Nature" was not one of Locke's great achievements. Locke does not try to reconsider his woefully confused ideas about the sources of law, which he locates this objective of practical rationality; even on Dunn's own account, he is just tragically aware of the problem, and that is all.

Locke is a master, however – and principally because of his work in metaphysics and epistemology. To describe this work, Dunn claims, would "do little to illuminate questions of current interest". But of interest to whom? Dunn cannot have modern philosophers in mind; for they remain fascinated by Locke's thought, and find an increasing amount of philosophically valuable material in it. If he means the intended audience of the book, why does he assume that they can only be interested in political questions?

Lindsay Judson

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Jeunesse Dorée by Ernst Frisch, 1926, an illustration from A. G. Lehmann's *The European Heritage: an outline of western culture* (Phaidon, £19.50).

essentially inactive. R. J. Bosworth's conception of matter as force surfaced in England in Joseph Priestley's materialism. Yolton argues that the dynamic conception of matter is more congenial to materialism.

Thinking Matter also contains useful discussions of eighteenth-century conceptions of space, of the idea of the "automatized man" and of the evolution of physiological theories during the period. Yolton concludes that none of England's so-called materialists was really a full-blooded materialist, unlike some French philosophers.

Why was the eighteenth-century debate so different from the modern one? It is not because their physiological theories were more primitive than ours, but because they did not possess the framework of reductive materialism with reference to which most of the modern discussion is conducted. Our discussion centres on analytical behaviourism and various developments of it, such as the causal analysis of mind and functionalism. Their theories are variations of emergent materialism and emergence is not particularly popular among analytical philosophers (though John Searle has recently defended it). Consequently, they are concerned with questions like: if complex bodies can think, does it follow that atoms have some elementary power of thought? Are mental states located at particular places in the brain, or are they properties of the whole? By contrast, as far as I can tell, no one in the seventeenth or eighteenth centuries considered the behaviourist or functionalist view that to think, perceive and feel is simply to be prone to move around and fidget in certain complicated ways.

Someone who thinks this a serious failure of imagination on their part will regard Yolton's controversy as having only historical interest. On the other hand, anyone who thinks reductive theories are so bizarre that they would not appeal to an imagination not corrupted by special pleading may find arguments of contemporary value in this book, irrespective of its contemporary relevance. *Thinking Matter* is a very useful contribution to the history of ideas.

H. M. Robinson

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Ethics for survival

The Imperative of Responsibility: In search of an ethics for the technological age
by Hans Jonas
University of Chicago Press, £19.55
ISBN 0 226 40596 6

At the time when the ethical problems connected with technological advance in so many separate fields are forcing themselves to the forefront of attention, it would be difficult to exaggerate the importance of Hans Jonas's closely argued and eloquent book.

Its subject is encapsulated in its subtitle: for what Jonas seeks to do is to provide the foundations for an ethics of human action appropriate to the situation in which mankind now finds itself. This situation is characterized, above all, by a growth in the power of technology to a point at which the causal reach of human action extends to the question of the very survival of the world. In the past,

The presence of man in the world had been a first and unquestionable given, from which all idea of obligation in human conduct started out. Now it has itself become an *object* of obligation: the obligation namely to ensure the very premise of obligation, that is, the *foothold*, for a moral universe in the physical world – the existence of mere candidates for a moral order. This entails, among other things, the duty to preserve this physical world in such a state that the conditions for that presence remain intact; which in turn means protecting the world's vulnerability from what could imperil those very conditions.

The field of ethics remains, as it always has been, co-extensive with the area of reality subject to the effect of human decisions; but since this area now includes the whole natural, organic and inorganic world, the ethics appropriate to the age must bring within its scope a range of issues which previous ethical systems could, quite properly, ignore. Where, previously, ethics could confine itself to investigation of the conditions of right order among men and to the evaluation of the immediate consequences of action, it must now take account of man's obligation to nature – both in itself and as the precondition for human life – and to the probable long-range effects of human activity.

We must educate our soul to a willingness to let itself be affected by the mere thought of possible fortunes and calamities of future generations, so that the projections of futurity will not remain mere food for idle curiosity or equally idle pessimism.

It is not temperamental pessimism but a carefully cultivated awareness of the lack of balance between the scope of technology and the finite resources of nature, including human nature, that leads Jonas to propose, in opposition to Ernst Bloch's technologically based principle of hope, a "heuristic of fear" as the guiding principle in our conduct.

Jonas does not avoid the difficult problems which his analysis raises. These difficulties are both practical and theoretical. They touch on questions of social policy as well as moral philosophy. As an example of the former consider the dilemma posed by a situation in which the relief of suffering among one's contemporaries can only be brought about by the use of means which further imperil the chances of future survival. Issues like this are not mere abstract possibilities for speculation. They arise in relation to the use of chemical fertilizers for the relief of starvation as well as through-out the increasingly important field of genetic engineering. The whole tenor of Jonas's argument tends towards the conclusion, harsh but surely correct, that when immediate suffering and the possibilities of long-term survival are weighed against each other it is the latter which must be given priority.

But by what right do we make such a judgment? What is the proper foundation of an ethics that gives priority to future possibilities over present certainties? In the central chapters of the book Jonas elaborates a metaphysics of morals which derives from the philosophy of nature enunciated in his previous work, in particular *The Phenomenon of Life* (1966). According to this philosophy, the realm of nature is permeated by teleology, not in the sense that it plays any knowable part in a divinely ordained scheme of things, but simply because every organism is oriented in its activities toward its own survival. One of the best things about the present volume is the way in which Jonas shows the importance of this premise in founding an ethical theory capable of resolving, intelligibly and consistently, the dilemmas inherent in the ambiguous gifts of a technology which cannot accomplish even undoubted goods without incurring incalculable future costs. The heuristics of fear, Jonas's updated generalization of the ancient concept of prudence as prime among the virtues required in practical philosophy, does not command us to abstain from technological innovation but only to give extra weight to what are very reasonable and scientifically well-founded fears about the effects such innovation may have. In seeming to tip the balance of judgment in this way a heuristics of fear actually redresses the initial imbalance produced by the inherent, innovative dynamic of technology itself. Conscious, prudent wisdom alone draws man to the recognition of that responsibility for the integrity of the world which, as a dependent but now dominant element in nature, he cannot in fact avoid.

The *Imperative of Responsibility* is a brilliant, clearly argued book which penetrates to the heart of the most intractable problems of the modern world. If ethical debate is to contribute anything to man's struggle for survival beyond the present century this is the sort of work we need in order to lay out its necessary agenda. Without illusion or despair, Hans Jonas brings us face to face with the issues on which any possible future depends.

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Catholic unions

The Church and Labour in Colombia
by Kenneth N. Medhurst
Manchester University Press, £25.00
ISBN 0 7190 0969 3

Rapid industrialization in one of Latin America's more conservative catholic countries has created a dilemma for the official church between a consensual approach to politics which is ultimately conservative in implication and a desire to preempt the dominance of the radical left in the trade union movement. In the 1930s, in an attempt to counter the spread of communist and socialist influences in the working class, the church promoted the formation of catholic unions, and by 1946 these were brought together into a national confederation in direct competition with the secular unions. The

latter were closely linked with the ruling Liberal Party, and depended on direct links with the state to deliver benefits for their constituents. To this form of "political bargaining" the church-sponsored unions countered a unionism which focused on direct economic bargaining between workers and employers on a local level, with recourse to strikes only as a matter of last resort.

The catholic unions were successful, and expanded rapidly, largely due to problems besetting their secular rivals. The once solidly liberal union movement had experienced a process of radicalization in the early 1940s and was now split between communists and the more traditional liberals. When the liberal government was replaced by conservatives in 1946 the radical unions were harassed, and lost a great deal of ground to the church-sponsored unions. By the early 1950s the catholic unions had become the single largest union confederation in Colombia, though they never at any point controlled a majority of union members.

With success came dilemmas for Catholic union leaders and for the church itself. As Kenneth Medhurst notes, it has been easy for higher church officials to overstate the degree of genuine commitment to religious aims in a population which is increasingly secular and only nominally Catholic.

As the catholic unions became more successful, they had less need to rely on church financial support and, at the same time, were faced with pressures to adopt a more militant stance. These pressures emanated from their own rank-and-file, the majority of whom felt that unions should be much more aggressive in promoting the class interests of their members than many in the hierarchy of the church could accept, and also from the development of new, radical union groupings which began to appear in the 1960s. The result was the emergence of internal conflict in the catholic unions; a conflict between union leaders, who were more in tune with the church hierarchy and the interests of the church, and a more militant group of workers' leaders, who were more in tune with the secular unions and the interests of the working class. The result was a conflict between the church hierarchy and the interests of the working class, and a conflict between the church hierarchy and the interests of the working class.

both more militant and more overtly political.

Polarization within the church itself between conservatives and progressives has meant that these tensions and dilemmas have not been resolved. Having launched the movement as an attempt to counter radical secular influences in the working class, the church is now in a situation in which many leaders and rank-and-file workers in the confederation ostensibly under its aegis regard the church as irrelevant, or even hostile, to the pursuit of working-class interests.

To some extent this dilemma noted by Medhurst between the conservative leanings of the church hierarchy and the militant defence of workers' interests is inherent in any claim to promote universal interests in a society divided by class conflict. However, the greater strength of the church hierarchy in the Colombian case, and the influence of the conservative influence in the Colombian church, as opposed to the situation in some other Latin American countries, has made this dilemma more acute. Indeed, what I missed most throughout the book were comparative references to

other Latin American countries. The deep splits in the labour movement at the end of World War II and their cold war resolution with the defeat of the communists was a drama played out in several of the more industrialized countries of Latin America. Where Colombia seems to have differed is in the ability of the catholic church to step into the place vacated by their rivals. It is the way in which similar conflicts have given rise to such a different outcome which makes the Colombian case so interesting.

Ian Roxborough

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BOOKS

A life of seclusion

The Selected Letters of Robert Bridges, with the correspondence of Robert Bridges and Lionel Muirhead, volume one edited by Donald E. Stanford. Associated University Presses, £42.95. ISBN 0874131774

Robert Bridges, like his near-contemporary Methuens, Thomas Hardy and George Bernard Shaw, continued to produce remarkable work even into his eighties – the years between the wars. Like theirs his gifts developed slowly, but in other respects his career was strikingly remote from those of his fellow Victorian and Edwardian authors. The letters, although "selected", make a bulky, arguably an over-weight collection. Volume one (1865-1908) contains over 500 pages; volume two, which is to include all the textual and biographical notes, will presumably be of comparable length. Probably few poets have better lived out the ideal of *mens sana in corpore sano*. Bridges rowed stroke for Eton and for his Oxford college, took a second class in Greats, and then qualified as a physician. Possessing an independent income, he had planned to practise medicine; he would then retire at 40, and devote himself to writing. Broadly speaking, this scheme was fulfilled: he retired at 37 and married at 40. Meanwhile and thereafter he followed a cool, sequestered life, befitting a country gentleman of cultivated tastes and sporting skills (notably riding and cricket): he wrote at leisure, and his work suggests an insistence on perfection rather than an urgency of creation. He was rarely unwell, but his wife, daughters and several close friends suffered repeatedly from ill-health: this in part explains his exceptional seclusion.

Among his principal correspondents in this volume are Lionel Muirhead, a country gentleman of similar tastes (to whom he wrote over 400 letters); the critics and academics A. H. Bullen, Edmund Gosse, G. Lowes Dickinson, J. W. Mackail and Logan Pearsall Smith; Canon Dixon, a mutual friend of Gerard Manley Hopkins, Samuel Butler, Henry Newbolt and W. B. Yeats. An early photograph admirably reproduces Bridges' splendid head, the intense animation of his gaze, and the sensitivity of his features. His friends testify to the extraordinary charm of his presence, and claim that there was no company in which he would not have been distinguished. Newbolt recalls him at a London dinner in 1898 "flashing wit and humour from every facet with the ease and quickness of the Elizabethan drama". Yet something in the act of correspondence seems to have dimmed the charisma and dulled the intellectual edge.

The letters are urbane, lucid, caring, courteous; they reveal an affectionate and generous nature, and are devoid of malice, exaggeration or self-importance. But in literary quality they are of low tension. For a countryman there are surprisingly few descriptions of the beautiful surroundings of Yattendon. Some of Muirhead's letters, relating

to his Murdoch, took a first in Greats moral philosophy even though she sees the publication of such novels as *The Bell* and *The Black Prince* as her greatest achievement. Simone de Beauvoir has made a significant contribution, as one would expect of an *agrégée de philosophie* who took the examination only a year after Sartre did, to the elaboration of existentialist ethics and feminist theory, but she will probably be remembered best for a semi-autobiographical writings which are candid, lucid and uniquely informative about intellectual movements in the Paris of the 1940s and after.

Neither writer would, I think, claim that philosophical speculation lies at the heart of her work; even less that it can only be understood in technical ways familiar to philosophers. This, however, is what Dr Butler advances for Beckett, especially the "residual"

Beckett, the author of the post-*How It Is* texts. The merit of his study is that it illuminates works like *The Last Ones* and *Lessness* which have received little critical attention so far and which, by virtue of his approach, turn out to be less dauntingly impenetrable to rational analysis and exegesis than has until now appeared to be the case. The originality of his approach lies in the detailed exposition of Heidegger, Sartre and Hegel which takes up three-quarters of the book and is undertaken in Beckettian terms. It prepares the way for an exposition of Beckett's meaning in works that are so compressed and allusive in expression that many readers give up trying to "understand" them as prose, and opt instead for an approach which treats them like difficult and obscure poetry shows that they are more comprehensible and more coherent when seen in the light of these philosophers, that they are, in fact, explorations in liter-

Wising up

American Tough: the tough-guy tradition and American character by Rupert Wilkinson. Greenwood Press, £27.95. ISBN 0313237972

Growing up in an American city meant that you had to become something of an expert cartographer. You had to learn, quickly, that there were "tough" neighbourhoods, schools, youth clubs and pool halls, as you learned later about tough bars and nightspots. The converse knowledge, that there were "safe" places, was equally local and specific. These mental maps, which usually coincided with racial and ethnic neighbourhoods, were accompanied by a clear hierarchy depending upon the toughness of the inhabitants. Jews inevitably came at the bottom of that class, if at none other; the Irish and Poles were usually near the top. Blacks, as ever a special case, were in a class of their own for toughness. These hierarchies were closely connected to perceptions of class and religion.

It is splendid to find a cultural historian engaging with toughness and the American character. The strange process by which certain kinds of social thought loses its intended professional audience and becomes common intellectual property will, if there is any justice in such matters, bring the many readers of *American Tough*, *The Lonely Crowd* and *The Culture of Narcissism* to Rupert Wilkinson's *American Tough*. Like the works by the Lynds, David Riesman and Christopher Lasch, Wilkinson addresses a large and important theme. Students of American history, politics and language will find *American Tough* a mine of insights and interpretations.

Wilkinson shows that the American concern for toughness was remarkably over-determined. The struggle to settle a continent, and the effort needed to create the industrial behemoth which the United States had become by the end of the nineteenth century, placed an absolute premium on certain values for which "toughness" is a complex shorthand. It is precisely at this point, when the west was finally closed to heroic settlement, and when the industrial system was firmly intact, that fears of the dangers of softness and

"over-civilization" raised toughness from the realm of practice to that of ideology.

As increasingly widespread and elaborate consumer demands could be met, there was a shift away from the thrifty values of the protestant work ethic towards a more visible style of consumption on the part of the rich. Neither Thorstein Veblen nor Simon N. Patten figure in Wilkinson's account, but they are significant theorists of consumptionist capitalism. There were increasingly vocal Jeremiahs who feared the effects of mass immigration, and who criticized the tendency of advanced capitalism to undermine through luxury and moral decay the fundamental values of thrift and hard work. From Theodore Roosevelt onwards it has been politically advantageous for presidents, and smaller political fry, to be perceived as being tough. Wilkinson has fascinating things to say about the pervasiveness of the language of toughness. There may have been feminization of culture, but Wilkinson identifies a counter-trend towards an even more aggressively masculine defining of stances and values. Those *echt* American idioms (hard-nosed, tough-as-nails, tough-cookie, hard-boiled) suggest how firmly established is the ethos of tough values in public usage.

Although he makes sparing use of the abundant literary materials, there is no doubt that *American Tough* sheds fascinating light on Hawkeye, Ahab, Studs Lonigan, Philip Marlowe, Stanley Kowalski and Richard Pryor's immortal "macho-man". There is another group of toughies who are less well served in Wilkinson's pages. He says that in the United States toughness has overwhelmingly been a male quality; in consequence he says little about female toughness and notes none of its literary representations, from Hester Prynne to Isabel Archer and Lily Bart. Had *American Tough* been written by a woman it would have been in some respects a different book. Behaviour would have been as important as attitudes, and one imagines the book would have been a little more concerned with the practical consequences of (male) aggression and toughness upon its (female) victims. There is no entry for victim in the index. As it is, it opens up important new areas in the study of American culture.

Eric Homberger

Eric Homberger is lecturer in American studies at the University of East Anglia.



Samuel Beckett

any form of the issues with which Heidegger grapples in *Being and Time*, Sartre in *Being and Nothingness*, and Hegel in *The Phenomenology of Mind*. He stays close to these grandly metaphysical writers (showing a most refreshingly unBritish willingness to engage with abstractions like the Void and the Absolute) without claiming that Beckett has necessarily been influenced directly by them; merely that he shares their metaphysical concerns.

He explains the enigmatic "voice" which is frequently mentioned in *Molloy* as "God, the Absolute, the author, that 'under a certain light all these are identical'". This "mystery" towards which his parables aspire but which they never attain! (That Dr Butler argues, is why Beckett's art, as many critics have pointed out, is an art of failure: if it falls short it is obviously, that is, in an obvious sense) unsuc-

cessful, but if it makes it, the prize is nix, nothing. "It is in the impossible going-on that Beckett, as man, speaks to us as man". Dr Butler concludes, "and it is within that, of course that Being is to be found, if anywhere". He is not confident that it can be found there either – for this is an admirably neutral study, with no ideological axe to grind – but if it can, then literature may come closer to it than philosophy". The reader may be as confident about that as Dr Butler implies that he is, but will find that the book gets closer than other attempts so magnificently aware of being crucified on the paradox that "having ended" he has never ended and must "end yet again".

John Fletcher

John Fletcher is professor of comparative literature in the University of East Anglia.

BOOKS

Ptolemy's universe

Ptolemy's *Almagest* translated and annotated by G. J. Toomer. Duckworth, £55.00. ISBN 0715615882

Astronomy is, by a very large margin, the oldest of what are still in many countries referred to as the "exact sciences", and *Almagest* is the most substantial of ancient texts on the subject. As a textbook of astronomy it is by any reasonable standards magnificent.

Spherical astronomy is rarely taught today, except as a rather tedious exercise of the books from which it is taught is very much that of the Ptolemaic prototype. As for the small matter of Copernicus and heliocentricity, which intervenes between us and the ancient world, this has changed our essentially Earth-centred perspective on the world less than might be imagined: added to which, the structure of Copernicus's *De Revolutionibus* is so remarkably similar to that of *Almagest* that the two might at a glance be very easily confused.

Almagest – the title comes from a bastardized Latin version of a blend of Arabic and Greek meaning "mathematical systematic treatise" – was written by Claudius Ptolemaeus in about AD 150. Of Ptolemy's person and social milieu, however, we know next to nothing. His name tells us that he was an Egyptian, with Greek, or at least Hellenized, ancestry; while the petrifaction "Claudius" shows him to have been a Roman citizen. Working in Alexandria, the chief city of Greco-Roman Egypt, he was excellently placed to write a general exposition, since Alexandria was in possession of what had been, and probably still was, the best library in the ancient world. Although it is possible that there were earlier treatises of similarly vast scope, they have not survived, perhaps because Ptolemy's so effectively replaced them. This is true, for instance, of the work of his great predecessor, Hipparchus, now known chiefly through *Almagest* itself. Indeed, part of the great importance of *Almagest* lies in the potential it holds for reconstructing the earlier history of astronomy.

Roughly speaking, there were two great Greek traditions for accounting for the complexities of observed planetary motions. The first, the system of "homocentric spheres" (like the layers of an onion, with the Earth at the centre), had been developed five

centuries before Ptolemy, especially by Eudoxus and Aristotle. The geometrical genius was Eudoxus, the philosophical support, and publicity, were provided by Aristotle. A century and more after Aristotle came the eccentric and epicyclic models of planetary motion, where the emphasis was on a two-dimensional representation; and here the first important name is that of Apollonius. Ptolemy falls into this second tradition, although there is some evidence (outside *Almagest*) that he also wanted to reconcile his views with the philosophical attractions of the Aristotelian system.

Ptolemy inherited more than Greek geometrical styles and models: he followed (through three centuries intervened) in the footsteps of Hipparchus, who had inherited a far richer collection of observational records than the Greeks could provide – those from Mesopotamia. In this way, the best of two worlds was combined, and astronomy became geometrical and quantitative. How many were its practitioners it is very hard to say; certainly, names are not plentiful. Ptolemy owed much to just one person, Menelaus, who lived about two generations before him, and who provided the basic spherical trigonometry which he exploited so effectively in *Almagest*.

It is as a result of the fact that we rely

so heavily on Ptolemy for earlier astronomical history, that a historical controversy about just how much Ptolemy did take from Hipparchus has rumbled on over the last two centuries, starting in earnest with J. H. J. Delambre in the early nineteenth century, and reaching a high point (in temperature, if nothing else) with the publication of R. R. Newton's *The Crime of Claudius Ptolemy* (1977), which Professor Toomer believes brought the whole topic into disrepute. Broadly speaking, the controversy concerns the intellectual honesty of Ptolemy in the manipulation of his observational, pseudo-observational, and computational material. The suggestion has been that he processed his materials in such a way as to make his theories seem more rigorous than was strictly justifiable. The controversy is one of great complexity, and it is a measure of the importance of this new translation that it will enable a wider audience than ever before to judge the issues for itself.

Until now there has been no adequate translation of *Almagest* into English. This serious lacuna has been more than adequately filled by G. J. Toomer, professor of the history of mathematics at Brown University, Rhode Island. His rendering is authoritative, and taken together with the

footnotes to the translation, which concern both the content and the readings accepted by J. L. Heiberg, editor of the standard edition of the Greek original, it assumes the status of an essential supplement to that edition.

A knowledge of the intellectual milieu in which *Almagest* was produced, is something that can be largely pieced together from Professor Toomer's introductory material, footnotes and appendices, although the book was not intended as a substitute for such aids as Olaf Pedersen's *A Survey of the Almagest* or Otto Neugebauer's *A History of Ancient Mathematical Astronomy*. As Toomer points out, the position of *Almagest* as the standard textbook in astronomy for advanced students in the schools in Alexandria (and no doubt in Athens and Antioch too) is demonstrated by the partially extant commentaries on it by Pappus (circa 320) and by Theon of Alexandria (circa 370).

Divided into thirteen books (in this version) occupying over six hundred pages, *Almagest* is of course cast in geometrical (Euclidean), rather than in a more easily digested trigonometrical, notation. Appearances are, however, at least partially misleading, for the first book – unfamiliar though its notational dress may be – is

a trigonometry, necessary for the work as a whole. In the following books we find spherical astronomy (rising times, length of daylight, and so on), the theory of the Sun, that of the Moon, the two luminaries together, the fixed stars, and – in the last five books – the five planets then known. Ptolemy took a knowledge of elementary geometry and arithmetic, for granted, not to mention a sexagesimal system, which is likely to be less well known to modern readers than his binary descendant.

Not least among the virtues of Professor Toomer's work is that it includes enough by way of an explanation of basic terminology and notation to enable modern readers with a smattering of Euclid to work through the text. Astronomers old enough to have been brought up on synodic and eclipse anomalies, rather than on microwave spectroscopy and nucleosynthesis, will feel very much at home. As for those who teach the history of astronomy, this attractively produced book, with its appendix of specimen calculations and its hundreds of emendations to Heiberg, should satisfy most tastes.

J. D. North

J. D. North is professor of the history of science at the University of Göteborg.

Physics was never the same

The Demon in the Aether: the life of James Clerk Maxwell by Martin Goldman. Paul Harris/Adam Hilger, £18.00. ISBN 0862280265

James Clerk Maxwell was born in Edinburgh in 1831 and died at Cambridge (where he was first Cavendish professor of experimental physics) in 1879. During his short life he laid the foundations of modern theoretical physics – a claim that may seem exaggerated in view of the highly advertised revolutions that have occurred in theoretical physics during the twentieth century, but it is true. Read any book on physics written before (and indeed many written after) Maxwell's *Treatise on Electricity and Magnetism* (1873) and you are in a completely old-fashioned world. Read Maxwell and you will find that, except in the description of electrical instruments, this is the kind of physics we learn today.

Referring to the schoolboy game of making lists of all-time great men, Martin Goldman remarks that "in physics a clear division does emerge: Archimedes, Newton, Maxwell and Einstein are in a different league from the rest". But Maxwell did not live long enough to acquire the same recognition as Newton or Einstein. Another three decades and Maxwell would have seen his epoch-making prediction of the existence of radio waves (1864), verified by Hertz in 1888 and put to use in trans-Atlantic communications by Marconi in 1901. With his strong personality and compulsive charm, he would have exerted as large an influence over younger men as did Newton – and probably a more benign one. But all his followers had to work with were four gracefully written books and a hundred scientific papers tardily collected together by W. D. Niven in 1890. As for his inaugural lecture at Cambridge in 1871, "Introductory Lecture on Experimental Physics", there is no finer statement of the meaning and value of scientific research and its relation to general culture.

In 1882, three years after Maxwell's death, there appeared a *Life of James Clerk Maxwell* written by his long-term friend Lewis Campbell, then professor of Greek at St Andrews University, in collaboration with William Garnett, Maxwell's demonstrator at Cambridge. The Campbell-Garnett biography is an unusual work, scarcely fitting Lytton Strachey's stereotype of the Victorian biography: "Those two fat volumes, with which it is our custom to commemorate the dead... with their tone of tedious panegyric, their lamentable lack of selection, of detachment, of design". A fair characterization is that as an account of Maxwell's scientific work it is pedestrian, as an account of his scientific career it is marginal, but that as an account of his

childhood and young manhood it is a work of genius, one of the most brilliant things done in the Victorian or any other age. All of which is to say that Campbell understood what he was doing while Garnett did not.

Martin Goldman sets out to redress the balance. Writing with the intention of being at least broadly comprehensible to a lay audience, he has had to restrict technical details in his account of Maxwell's work, but he has done well. The two chapters on the twin peaks of Maxwell's achievement, the electromagnetic theory of light and the molecular gas theory (the "aether" and the "demon" of the title) are clear and sound. The chapter on Maxwell's other scientific work, which ranges from taking the first colour photograph to writing the first significant paper on automatic control theory (cybernetics), provides a picture of the breadth of the man aptly summarized in Goldman's quotation from the late Professor C. A. Coulson: "There is hardly one of [Maxwell's] papers] which does not open up some new field. There is scarcely a single topic that he touched upon which he did not change almost beyond recognition."

The biographical chapters are even more successful. By reading many of the original sources, Goldman has been able to re-tell Campbell's story with freshness and supply the best account yet of Maxwell's professional career. Above all he has that most essential quality in a biographer, detached sympathy. He remarks in the preface: "During the writing of this book I have come to appreciate James Clerk Maxwell more and more, both as a scientist and as a man." Readers will share Goldman's experience. Maxwell was a great scientific genius but he was an even greater man. Gentle but with a very tough core, intensely rational yet with a deep sense of the mystery of life, serious but gifted with a wildly droll sense of humour, courteous but capable on occasion of what Goldman rightly calls a "splendid rudeness" – it is an intriguing mixture. Even more intriguing is the way this quintessential Christian gentleman, who spent so much of his life on a remote estate in the southwest of Scotland inherited through an illegitimate line from the ninth Lord Maxwell, has appeared to people of widely varied character and background.

C. W. F. Everitt

C. W. F. Everitt is affiliated with the W. H. Hanson Laboratories of Physics at Stanford University, and author of *James Clerk Maxwell: physicist and natural philosopher* (Scribners, 1975).

A collection of documents surrounding James Clerk Maxwell's "On the Stability of the Motion of Saturn's Rings" (1856) has been edited by Stephen G. Brush, C. W. F. Everitt and Elizabeth Garber, and published with an introduction and the original paper as *Maxwell on Saturn's Rings* by MIT Press at £22.50.

A paperback edition of *The Leibniz-Clarke Correspondence*, with extracts from Newton's "Principia" and "Opticks", edited by H. G. Alexander, has been published by Manchester University Press at £4.95.

Swedish pioneer

Linnaeus: the man and his work edited by Tore Frängsmyr, with contributions by Sten Lindroth, Gunnar Eriksson and Gunnar Broberg. University of California Press, £21.25. ISBN 0520045688

The Swedish naturalist Linnaeus (1707-78) has the status of a "great man" in the history of science. His name is frequently invoked in connection with both specific innovations, such as binomial nomenclature and the sexual system of classification, and with the general enthusiasm for ordering and celebrating the richness of nature in the eighteenth century. Yet the literature on Linnaeus in English is surprisingly sparse.

Although these four essays have appeared previously in Swedish between 1965 and 1976, they do not seem to have been updated for this translation, making the footnotes, already limited in their references to secondary materials, seriously out of date. It is in this respect that the book is a questionable service: subtitled *Linnaeus and his work*, it explores neither the man, the contributors freely admit that he was arrogant, opinionated, parading, for this is one place where the man and his work are closely linked. Inevitably the essays vary in quality; those by

Frängsmyr and Broberg, on geology and the classification of man respectively, are the best of the four. But even they tend to confine themselves to a descriptive summary of Linnaeus's ideas.

It is, however, important to recognize the difficulties of writing about a figure like Linnaeus. There are two reasons for this. First, much of his work was in taxonomy and therefore based on detailed descriptions of natural objects. It is tedious to rehearse these, yet hard to explain the significance of different classificatory schemes without concrete examples. Linguistic precision in the use of terms like "species", "genus" and "order" is essential, but expressing in simple language how such ideas were developed and used can be difficult. Second, it is almost impossible to write about a single person without isolating them from their context, and even if the aim is to debunk the "great man" syndrome, the concentration on a special mind reinforces notions of genius which undermine a properly historical account. While this may be appropriate on occasions, it can have an intellectually deadening effect.

In the end, contrary to our expectations, we have no sense of his social and Swedish milieu, no idea how being Linnaeus affected his thought, and no feel for why people cared so much about natural history in the eighteenth century.

L. J. Jordanova

L. J. Jordanova is lecturer in history at the University of Essex.

Ending yet again

Samuel Beckett and the Meaning of Being: a study in ontological paradox by Lance St John Butler. Macmillan, £25.00. ISBN 0333147473

Is Beckett a philosopher of a kind? Can literature usefully engage with philosophical issues? Can it, in particular, shed light on such central metaphysical problems as the meaning of being? To all these questions, Dr Butler replies emphatically "yes". I'm not so sure. A few creative writers are also philosophers by train-

السلامة

Publications

Ming Tso's *Another-Tongue Mountain* is a survey of part-time Chinese language classes, based on interviews in London, Manchester, Edinburgh and Liverpool. The booklet is available free from the Commission for Racial Equality, Elliot House, 10-12 Allington Street, London SW1E 5EH.

Number one in the series Bow Educational Briefings is *Political Ideas in Western Europe Today* by the Conservative MP for Warrington, Robert Jackson. It is available at £2 from The Bow Group, 240 High Holborn, London WC1V 7DT.

The latest *Bulletin of the Institute of Development Studies* at the University of Sussex focuses on 'Developmental states in East Asia: Japan, Korea and Taiwan'. Ten contributors examine a number of issues, including state intervention, administrative tradition, foreign and foreign investment in China, Korea, and Taiwan. Copies, prospectuses and a list of writings by IDS Members are available from IDS Publications, University of Sussex, Brighton BN1 9RE.

The Manpower Services Commission has collaborated with Longman's, the educational publishers, to produce a new package for the Youth Training Scheme. *Training for Versatility* comprises a much-praised video starring pop star Buster Bloodvessel and Ianie Long, and is narrated by Radio 1 disc jockey Mike Smith, together with four book and two board games. The texts, *Improve Your Writing*, *Improve Your Reading*, *Improve Your Learning*, *Improve Your Number Skills*, together with other resources and a teachers' handbook are available direct from Longman, 32-35 Tanner Row, York YO1 1JP. Contact Cathy Hick on 0904 3801 for further details.

Appointments

STRATHCLYDE
Professor David J. Tedford of Strathclyde University's department of electronic and electrical engineering has been appointed deputy principal of the university. He has also been appointed vice principal designate.

LIVERPOOL
Lecturership: P. H. Mellor (electrical engineering and electronics); Dr J. E. Mollenhead (medical engineering); D. Atkinson (ecology).

The City Lit - one of London's best-known adult education centres - has appointed a new principal. Mr William Tyler is current principal of the Manchester College of Adult Education. He succeeds Dr John Smith, CBE, who has been in charge at the City Lit since 1968.

Promotions

UNIVERSITY OF WALES
Privileged Cymru
Readership: Dr K. Board (electrical and electronic engineering, University College, Swansea); Dr Muriel Chamberlain (History, University College, Swansea); Dr A. C. Cryer (Biology, University College, Cardiff); Dr R. A. Dodgson (Geography, University College, Aberystwyth); Rev Iwan Ffowc Ellis (Welsh, Saint David's University College, Lampeter); Dr J. R. Eber-

ington (plant science, University College, Cardiff); Mr G. N. Harding (political theory and government, University College, Swansea); Dr Roger Hughes (animal biology, University College, Bangor); Rev Dr Gwynn H. Jones (biblical studies, University College, Bangor).

BRUNEL
Personal professorships: Dr Roger Dean (cell biology).
Readerships: Dr R. Dhawan (department of law); Dr J. H. P. Tynan (chemistry).

SOUTHAMPTON
Personal professorships: Dr Howard Allen (structural engineering); Dr

LIVERPOOL
Personal professorships: Dr Barry Hindess (social statistics / sociology); Dr Michael Orme (pharmacology and therapeutics); Dr David Williams (dentistry / dental sciences).
Senior lectureships: A. Turner (orthopaedic and accident surgery); M. E. Molyneux (tropical medicine); P. J. Rowe (law).

Geoffrey Lawson (mathematical curriculum studies).
Readerships: Dr R. C. King (mathematics).

Senior lectureships: Dr S. D. Winton (biology); Dr A. J. Rest (chemistry); Dr J. Evans (chemistry); Mr E. J. Zulawski (electronics); Dr M. J. Griffin (Institute of Sound and Vibration Research); Mr A. Ullrich (neurophysiology); Dr H. V. Griener (nutrition); Dr D. F. Cooper (accounting and management science).

Monday August 27
12.18 Mathematics Across the Curriculum. Drawing to a conclusion (PME23; prog 7).
12.40 Contemporary Issues in Education. A kind of necessity: education for adults (E200; prog 18).

12.42 Introduction to Pure Mathematics. Homomorphisms (M203; prog 27).
12.44 Research Methods. Complex Modelling (DE34; prog 6).
12.46 Decision Making in Britain. The public enemy (D388; prog 14).

12.48 Third World Studies. Health care in Mozambique: a basic need (U204; prog 13).
12.50 Modern Art and Modernism. Greenberg on Pollock (A131; prog 28).

RADIO 3 (VHF)
6.55 An Applied Population. Residential care (P252; prog 14).
7.16 Art and Environment. Context, Path and Boundary (2) (TA129; prog 27).

7.38 Technology Foundation Course. Technology in the past (T101; prog 16).
23.20 Arts Foundation Course. The education of a man in mid-Victorian England (A101; prog 27).

23.40 Social Psychology. Applied Research in social psychology (D385; prog 15).

Sunday August 26
6.55 Surface and Sedimentary Processes. Tunneling and tunnelling (P10; prog 10).
7.10 Probability and Statistics. Title to be announced (M245; prog 14).

7.12 The Earth's Structure, Composition and Evolution. Shooting the Moon (S217; prog 14).
7.14 Technology Foundation Course. Living with technology (T101; prog 16).

7.16 Probability and Statistics. Title to be announced (M245; prog 14).
7.18 The Earth's Structure, Composition and Evolution. Shooting the Moon (S217; prog 14).

7.20 Technology Foundation Course. Living with technology (T101; prog 16).
7.22 The Earth's Structure, Composition and Evolution. Shooting the Moon (S217; prog 14).

7.24 Technology Foundation Course. Living with technology (T101; prog 16).
7.26 The Earth's Structure, Composition and Evolution. Shooting the Moon (S217; prog 14).

7.28 Technology Foundation Course. Living with technology (T101; prog 16).
7.30 The Earth's Structure, Composition and Evolution. Shooting the Moon (S217; prog 14).

7.32 Technology Foundation Course. Living with technology (T101; prog 16).
7.34 The Earth's Structure, Composition and Evolution. Shooting the Moon (S217; prog 14).

7.36 Technology Foundation Course. Living with technology (T101; prog 16).
7.38 The Earth's Structure, Composition and Evolution. Shooting the Moon (S217; prog 14).

7.40 Technology Foundation Course. Living with technology (T101; prog 16).

Chairs

Dr K. J. Treharne has been appointed head of the plant science division at Long Ashton Research Station and director of the station. The post also carries a chair at Bristol University and headship of the university's department of agriculture and horticulture.

Dr Wynne Harten, senior research fellow at Chelsea College, University of London, has been appointed to the Sydney Jones chair of science education at the University of Liverpool.

Dr Alan de Pennington, senior lecturer in the University of Leeds department of mechanical engineering, has been appointed to the newly-established chair of computer-aided engineering at the University of Leeds.

Mr John Russell Hinnells, senior lecturer in comparative religion, is to be professor of comparative religion at the University of Manchester from September 1.

Grants

NEWCASTLE UPON TYNE
Dr A. W. Skilton, £37,000 from North of England Cancer Research Campaign (serum glutathione transferase isoenzymes and potential as cancer marker); Dr Kendall-Taylor, £29,254 from MRC (mechanisms regulating cell growth and proliferation in normal thyroid and autoimmune thyroiditis); Dr B. H. Hirst, £3,000 from Astra Pharmaceuticals Ltd (gastrointestinal physiology); Professor D. Eccleston and Dr M. Place, £400 from Mental Health Foundation (disturbed adolescents and their families); Professor P. T. Emery and Dr H. M. Arthur, £58,965 from MRC (role of DNA helicase II in DNA repair and replication in E. coli); Professor F. Goodridge, £4,324 from British Tech Group (electronic system with microprocessor); Professor R. V. Thompson, £27,000 from SAP Ltd (control programme); Dr J. S. Hutcheson and Professor L. Mander, £43,050 from SERC (solid state vibratory gyroscope); Professor R. N. Parkins, £25,215 from MUD (corrosion fatigue in high yield strength steels); Dr R. L. Townsin, £20,000 from Society of Naval Architects and Marine Engineers (rough propeller penalties); Professor D. J. G. Cant, £67,171 from AFRC (digital microfluidics and related micro production studies); Professor D. G. Armstrong, £14,844 from Nutrilix Ltd (single nucleotides).

OPEN
Dr C. Pilling, £159,305 from SERC (stable isotope studies of primitive matter in solar system); Dr S. Drury, £35,424 from NERC (remote sensing evaluation of satellite imagery and SIFT satellite data for geological mapping and mineral exploration); Professor J. J. Sparks, £23,850 from Anglo-Portuguese (information technology education and training plans); Professor D. L. Nuttall and Dr P. Cliff, £31,000 from Leverhulme Trust (nature, impact and effectiveness of schemes for improvement of school teachers); Dr K. Aitkenborough, £27,000 from a consortium of industrial companies (preparation of industrial training courses and underpinning principles); Dr J. H. Johnson and Dr F. Holroyd, £31,476 from Natural Environment Research Council (classification algorithms for digital cartographic data, based on many possible pixel structures and investigation of

pixel structure); Professor R. Fildes, £19,785 from SERC (database of village to current tractor use and application to filter design); Dr T. O'Shea, £6,000 from SERC (computer-aided learning aspects of the SERC ALVEOLAR programme); Dr K. Williams, £11,500 from DTI (characterization of base metal research rates on structural steels in simulated marine environments); Professor N. Gower, £17,000 from ILEA (teacher fellowship); Dr E. K. Gibson with Dr C. Pilling, £734 from Leverhulme Trust (fluid and volatiles in meteorites); Dr I. R. £2,045 from Milton Keynes Development Corporation (spores and antibiotics in Milton Keynes); Dr M. Stewart, £1,200 from Nuffield Foundation (chronic administration of alcohol and brain function); Dr D. I. Great £3,400 from Rolls Royce Ltd (high thickness measurements of turbine turbine blades); Dr S. P. Lynch with Dr K. Williams, £2,742 from SERC (role of crack tip plasticity in embrittlement of fracture of ductile alloys); Mr G. Normie, £1,250 from British Council (British and American Network for Adult Education Conference); Mr N. West £2,000 from Consumers' Association (growing trials on 13 organic additives).

NEWCASTLE UPON TYNE
Dr C. T. G. Fildes, £18,850 from SERC (database of village to current tractor use and application to filter design); Dr T. O'Shea, £6,000 from SERC (computer-aided learning aspects of the SERC ALVEOLAR programme); Dr K. Williams, £11,500 from DTI (characterization of base metal research rates on structural steels in simulated marine environments); Professor N. Gower, £17,000 from ILEA (teacher fellowship); Dr E. K. Gibson with Dr C. Pilling, £734 from Leverhulme Trust (fluid and volatiles in meteorites); Dr I. R. £2,045 from Milton Keynes Development Corporation (spores and antibiotics in Milton Keynes); Dr M. Stewart, £1,200 from Nuffield Foundation (chronic administration of alcohol and brain function); Dr D. I. Great £3,400 from Rolls Royce Ltd (high thickness measurements of turbine turbine blades); Dr S. P. Lynch with Dr K. Williams, £2,742 from SERC (role of crack tip plasticity in embrittlement of fracture of ductile alloys); Mr G. Normie, £1,250 from British Council (British and American Network for Adult Education Conference); Mr N. West £2,000 from Consumers' Association (growing trials on 13 organic additives).

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Classified Linage - £2.30 per line	Classified Linage:
Minimum 3 lines - @ £6.90	Monday 10.00 am in the week of publication
Box number - £2.00	

Universities

Cranfield
Lecturer in
Operations
Management

The Cranfield School of Management wishes to appoint a Lecturer who will be expected to contribute to teaching and research across the broad range of operations management and to specialise in one or more of the following areas: Materials Management, Manufacturing Planning and Control, Technology Management, Service Operations.

A high standard of teaching is required at both post-graduate and experienced management levels.

Candidates should have a good first degree (a higher degree in business would be an advantage), business experience and at least some experience of teaching/lecturing, though not necessarily in an educational environment. The preferred age range is 25-35.

The current Lecturer salary scale rises to £14,125 (under review) and assistance may be given with relocation expenses.

Enquiries should be addressed to the Personnel Department, Cranfield Institute of Technology, Cranfield, Bedford, MK43 0AL; telephone Bedford (0234) 750111 extension 3338.

University of Strathclyde
DEPARTMENT OF MARKETING
PART-TIME TEMPORARY
LECTURES

Applications are invited for three lectureships each tenable for a three-year period and equivalent to 60% of the normal full-time appointment. Applicants should possess a degree in Marketing, Economics or related discipline and have relevant practical experience. The successful candidates will be required to contribute to the supervision of post-graduate students.

Salary on Lecturers scale (£7,190-£14,125 per annum).
USS benefit.

Application forms and further particulars (quote Ref: 49/84) available from Staff Office, McCance Building, 16 Richmond Street, Glasgow G1 1XQ.

Closing date for applications: 7 September, 1984.

University of Sheffield
DEPUTY DIRECTOR OF FINANCE

Applications are invited for a Deputy Director of Finance. The post holder will be responsible for the day-to-day running of the Finance Department and will be expected to contribute to the development of the Department.

Salary on Grade 14 (£14,125-£17,125 per annum).
USS benefit.

Application forms and further particulars (quote Ref: 49/84) available from Staff Office, McCance Building, 16 Richmond Street, Glasgow G1 1XQ.

Closing date for applications: 7 September, 1984.

University of Cambridge
SECRETARY OF THE SCHOOL OF CLINICAL MEDICINE

Applications are invited for the Secretary of the School of Clinical Medicine. The post holder will be responsible for the day-to-day running of the School and will be expected to contribute to the development of the School.

Salary on Grade 14 (£14,125-£17,125 per annum).
USS benefit.

Application forms and further particulars (quote Ref: 49/84) available from Staff Office, McCance Building, 16 Richmond Street, Glasgow G1 1XQ.

Closing date for applications: 7 September, 1984.

University of St Andrews
IRVINE CHAIR OF CHEMISTRY

Applications are invited for the Irvine Chair of Chemistry. The post holder will be responsible for the day-to-day running of the Chair and will be expected to contribute to the development of the Chair.

Salary on Grade 14 (£14,125-£17,125 per annum).
USS benefit.

Application forms and further particulars (quote Ref: 49/84) available from Staff Office, McCance Building, 16 Richmond Street, Glasgow G1 1XQ.

Closing date for applications: 7 September, 1984.

University of St Andrews
CHAIR OF NATURAL PHILOSOPHY (Experimental Physics)

Applications are invited for the Chair of Natural Philosophy (Experimental Physics). The post holder will be responsible for the day-to-day running of the Chair and will be expected to contribute to the development of the Chair.

Salary on Grade 14 (£14,125-£17,125 per annum).
USS benefit.

Application forms and further particulars (quote Ref: 49/84) available from Staff Office, McCance Building, 16 Richmond Street, Glasgow G1 1XQ.

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Universities continued

THE UNIVERSITY OF WESTERN AUSTRALIA, Perth

UNIVERSITY RESEARCH FELLOWSHIPS (POST-DOCTORAL)

Up to three Research Fellowships will be taken up in 1985. Appointment will normally be for two years in the first instance. Fellowships may be renewed for a further year, but only in conjunction with new applications. Fellowships are open to holders of a Ph.D. or equivalent qualification in the field of research. Applications should be sent to the Director of Research, University of Western Australia, Stirling Campus, 30 Stirling Highway, Perth, Western Australia 6008 by 30 September 1984. Copies of the principles governing the award of Research Fellowships are available from the Director of Research. Applications should be sent to the Director of Research, University of Western Australia, Stirling Campus, 30 Stirling Highway, Perth, Western Australia 6008 by 30 September 1984. Applications should be sent to the Director of Research, University of Western Australia, Stirling Campus, 30 Stirling Highway, Perth, Western Australia 6008 by 30 September 1984.

IRELAND

JEFFERSON SMURFIT PROFESSORSHIP OF BUSINESS LAW

A Professorship of Business Law, sponsored by the Jefferson Smurfit Group, has been established at the University of Limerick, Ireland. The Professorship is a response to the growing evidence that legal training is essential to business and industry in Ireland. The Professorship is being filled through annual selection appointments of scholars expert in some area of Business Law. In addition to the normal duties, the appointee will be expected to give a public lecture in the subject. The appointment will be for a maximum of twelve months but could be for a shorter period. Applications are now invited for the position 1985/86. Further information may be obtained from the Registrar, University of Limerick, 20 College Road, Limerick, Ireland. Applications should be sent to the Registrar, University of Limerick, 20 College Road, Limerick, Ireland. Applications should be sent to the Registrar, University of Limerick, 20 College Road, Limerick, Ireland.

Massey University, Palmerston North, New Zealand

POSTDOCTORAL RESEARCH FELLOWSHIP IN PIG NUTRITION

Applications are invited for the above position in the Department of Animal Science, Massey University, Palmerston North, New Zealand. The position is available from 1st October 1984. The appointee will be expected to give a public lecture in the subject. The appointment will be for a maximum of twelve months but could be for a shorter period. Applications are now invited for the position 1985/86. Further information may be obtained from the Registrar, University of Limerick, 20 College Road, Limerick, Ireland. Applications should be sent to the Registrar, University of Limerick, 20 College Road, Limerick, Ireland. Applications should be sent to the Registrar, University of Limerick, 20 College Road, Limerick, Ireland.

University College, Cardiff

RESEARCH ASSOCIATE NEW TECHNOLOGY INSTRUMENTATION

A laboratory instrument/University project has been established under a co-funded research scheme. A post research associate is required to assist a team in the development of new instrumentation for the measurement of pressure, temperature, and flow. The appointee will be expected to give a public lecture in the subject. The appointment will be for a maximum of twelve months but could be for a shorter period. Applications are now invited for the position 1985/86. Further information may be obtained from the Registrar, University of Limerick, 20 College Road, Limerick, Ireland. Applications should be sent to the Registrar, University of Limerick, 20 College Road, Limerick, Ireland. Applications should be sent to the Registrar, University of Limerick, 20 College Road, Limerick, Ireland.

THE UNIVERSITY OF WESTERN AUSTRALIA, Perth

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The University of New South Wales, Sydney, Australia

LECTURER IN SCHOOL OF PSYCHOLOGY

A Professorship of Psychology, sponsored by the University of New South Wales, has been established at the University of New South Wales, Sydney, Australia. The Professorship is a response to the growing evidence that psychological research is essential to business and industry in Australia. The Professorship is being filled through annual selection appointments of scholars expert in some area of Psychology. In addition to the normal duties, the appointee will be expected to give a public lecture in the subject. The appointment will be for a maximum of twelve months but could be for a shorter period. Applications are now invited for the position 1985/86. Further information may be obtained from the Registrar, University of Limerick, 20 College Road, Limerick, Ireland. Applications should be sent to the Registrar, University of Limerick, 20 College Road, Limerick, Ireland. Applications should be sent to the Registrar, University of Limerick, 20 College Road, Limerick, Ireland.

University of Queensland, Australia

SENIOR LECTURER/LECTURER IN FINE ARTS

Applications are invited for the above position in the Department of Fine Arts, University of Queensland, Australia. The position is available from 1st October 1984. The appointee will be expected to give a public lecture in the subject. The appointment will be for a maximum of twelve months but could be for a shorter period. Applications are now invited for the position 1985/86. Further information may be obtained from the Registrar, University of Limerick, 20 College Road, Limerick, Ireland. Applications should be sent to the Registrar, University of Limerick, 20 College Road, Limerick, Ireland. Applications should be sent to the Registrar, University of Limerick, 20 College Road, Limerick, Ireland.

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Griffith University, Australia

SCHOOL OF SOCIAL AND INDUSTRIAL ADMINISTRATION

SENIOR LECTURER/LECTURER MARKETING/STRATEGIC MANAGEMENT

The School is concerned with teaching and research in the structures and processes of organisations of all types. Its programme of study is a broad-based, generalist degree in Business Administration, with a major specialisation in Marketing and Strategic Management. The School is currently seeking a Senior Lecturer in Marketing and a Lecturer in Strategic Management. The successful applicant will be expected to give a public lecture in the subject. The appointment will be for a maximum of twelve months but could be for a shorter period. Applications are now invited for the position 1985/86. Further information may be obtained from the Registrar, University of Limerick, 20 College Road, Limerick, Ireland. Applications should be sent to the Registrar, University of Limerick, 20 College Road, Limerick, Ireland. Applications should be sent to the Registrar, University of Limerick, 20 College Road, Limerick, Ireland.

The University of Manchester

ASSISTANT INFORMATION OFFICER

The Director of Communications, who is responsible for the University's public relations and information services, is seeking an Assistant Information Officer. The successful applicant will be expected to give a public lecture in the subject. The appointment will be for a maximum of twelve months but could be for a shorter period. Applications are now invited for the position 1985/86. Further information may be obtained from the Registrar, University of Limerick, 20 College Road, Limerick, Ireland. Applications should be sent to the Registrar, University of Limerick, 20 College Road, Limerick, Ireland. Applications should be sent to the Registrar, University of Limerick, 20 College Road, Limerick, Ireland.

University of Keele

DEPARTMENT OF PHYSICS

POSTDOCTORAL RESEARCH ASSISTANT

Applications are invited for the above position in the Department of Physics, University of Keele, England. The position is available from 1st October 1984. The appointee will be expected to give a public lecture in the subject. The appointment will be for a maximum of twelve months but could be for a shorter period. Applications are now invited for the position 1985/86. Further information may be obtained from the Registrar, University of Limerick, 20 College Road, Limerick, Ireland. Applications should be sent to the Registrar, University of Limerick, 20 College Road, Limerick, Ireland. Applications should be sent to the Registrar, University of Limerick, 20 College Road, Limerick, Ireland.

University of Durham

TEMPORARY LECTURER IN QUANTITATIVE METHODS

Applications are invited for the above position in the Department of Quantitative Methods, University of Durham, England. The position is available from 1st October 1984. The appointee will be expected to give a public lecture in the subject. The appointment will be for a maximum of twelve months but could be for a shorter period. Applications are now invited for the position 1985/86. Further information may be obtained from the Registrar, University of Limerick, 20 College Road, Limerick, Ireland. Applications should be sent to the Registrar, University of Limerick, 20 College Road, Limerick, Ireland. Applications should be sent to the Registrar, University of Limerick, 20 College Road, Limerick, Ireland.

University of Cambridge

PROFESSORSHIP OF SLAVONIC STUDIES

PROFESSORSHIP OF SOCIOLOGY

Applications are invited for the above positions in the Faculty of Social Sciences, University of Cambridge, England. The positions are available from 1st October 1984. The appointees will be expected to give a public lecture in the subject. The appointments will be for a maximum of twelve months but could be for a shorter period. Applications are now invited for the position 1985/86. Further information may be obtained from the Registrar, University of Limerick, 20 College Road, Limerick, Ireland. Applications should be sent to the Registrar, University of Limerick, 20 College Road, Limerick, Ireland. Applications should be sent to the Registrar, University of Limerick, 20 College Road, Limerick, Ireland.

The British Academy

Post-doctoral Fellowships in Japan

The Japan Society for the Promotion of Science (JSPS) is offering up to three Post-doctoral Fellowships in Japan for holders of a Ph.D. or equivalent qualification in the field of research. The Fellowships are open to holders of a Ph.D. or equivalent qualification in the field of research. Applications should be sent to the Director of Research, University of Western Australia, Stirling Campus, 30 Stirling Highway, Perth, Western Australia 6008 by 30 September 1984. Copies of the principles governing the award of Research Fellowships are available from the Director of Research. Applications should be sent to the Director of Research, University of Western Australia, Stirling Campus, 30 Stirling Highway, Perth, Western Australia 6008 by 30 September 1984. Applications should be sent to the Director of Research, University of Western Australia, Stirling Campus, 30 Stirling Highway, Perth, Western Australia 6008 by 30 September 1984.

Polytechnics

GLASGOW COLLEGE OF TECHNOLOGY

The College is a polytechnic type institution of advanced higher education which is a member of the Scottish Central Institutions. The College is currently seeking a Senior Lecturer in the Department of Computing. The successful applicant will be expected to give a public lecture in the subject. The appointment will be for a maximum of twelve months but could be for a shorter period. Applications are now invited for the position 1985/86. Further information may be obtained from the Registrar, University of Limerick, 20 College Road, Limerick, Ireland. Applications should be sent to the Registrar, University of Limerick, 20 College Road, Limerick, Ireland. Applications should be sent to the Registrar, University of Limerick, 20 College Road, Limerick, Ireland.

North Staffordshire Polytechnic

RESEARCH ASSISTANT

Applications are invited for the above position in the Department of Computing, North Staffordshire Polytechnic, England. The position is available from 1st October 1984. The appointee will be expected to give a public lecture in the subject. The appointment will be for a maximum of twelve months but could be for a shorter period. Applications are now invited for the position 1985/86. Further information may be obtained from the Registrar, University of Limerick, 20 College Road, Limerick, Ireland. Applications should be sent to the Registrar, University of Limerick, 20 College Road, Limerick, Ireland. Applications should be sent to the Registrar, University of Limerick, 20 College Road, Limerick, Ireland.

Personal

IMMEDIATE ADVANCES £100 TO £200,000. Written terms on request. Regional Trust Ltd., 31 Dover Way, Piccadilly, London W1A 3AT. Phone 01-254 2121. Fax 01-254 2122.

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Polytechnic of Central London

Faculty of Engineering & Science

MICRO-ELECTRONICS FOR COMMUNICATIONS

As part of the extensive Microelectronics Programme, the Polytechnic of Central London is offering a new MSc course in Microelectronics for Communications. The course is designed to provide students with a solid foundation in the theory and practice of microelectronics, with a particular emphasis on the design and development of integrated circuits for communication systems. The course is open to holders of a BSc or equivalent qualification in a related field. Applications should be sent to the Director of Research, University of Western Australia, Stirling Campus, 30 Stirling Highway, Perth, Western Australia 6008 by 30 September 1984. Copies of the principles governing the award of Research Fellowships are available from the Director of Research. Applications should be sent to the Director of Research, University of Western Australia, Stirling Campus, 30 Stirling Highway, Perth, Western Australia 6008 by 30 September 1984. Applications should be sent to the Director of Research, University of Western Australia, Stirling Campus, 30 Stirling Highway, Perth, Western Australia 6008 by 30 September 1984.

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Polytechnics continued

URGENT

ROBERT GORDON'S INSTITUTE OF TECHNOLOGY, ABERDEEN
SCHOOL OF ELECTRONIC AND ELECTRICAL ENGINEERING
LECTURESHIPS
Applications are invited from candidates with a minimum of an honours degree, capable of contributing to the School. Vacancies exist over the range of disciplines, and although industrial/research/education experience is desirable, well qualified recent graduates may be considered. Salary range £8,698 - £13,716 per annum. Details from Secretary, Robert Gordon's Institute of Technology, Schoolhill, Aberdeen, AB9 1FR. (0224 633811) (10768)

Polytechnic of Central London

Faculty of Engineering & Science

MICRO-ELECTRONICS FOR COMMUNICATIONS

As part of the extensive Microelectronics Programme, the Polytechnic of Central London is offering a new MSc course in Microelectronics for Communications. The course is designed to provide students with a solid foundation in the theory and practice of microelectronics, with a particular emphasis on the design and development of integrated circuits for communication systems. The course is open to holders of a BSc or equivalent qualification in a related field. Applications should be sent to the Director of Research, University of Western Australia, Stirling Campus, 30 Stirling Highway, Perth, Western Australia 6008 by 30 September 1984. Copies of the principles governing the award of Research Fellowships are available from the Director of Research. Applications should be sent to the Director of Research, University of Western Australia, Stirling Campus, 30 Stirling Highway, Perth, Western Australia 6008 by 30 September 1984. Applications should be sent to the Director of Research, University of Western Australia, Stirling Campus, 30 Stirling Highway, Perth, Western Australia 6008 by 30 September 1984.

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Senior Research Officer

URGENT

The Institute for Fiscal Studies, an independent microeconomic research organisation studying the impact of government policy, expanding its work in a number of areas. There is currently a vacancy at Senior Research Officer level. The post may involve work on the effect of tax on company behaviour, but there will be opportunities for research in a number of areas of public policy. The current research team comprises 14 full-time economists with substantial computing facilities and is well connected with government, business and academia. Salary scale £10,050-£13,950 depending on age and experience. Secondment terms may be arranged. Send full curriculum vitae stating current salary together with covering letter to: Nicola Spencer, The Institute for Fiscal Studies, 7, Watlington Lane, London SW1E 6DR. Tel: 01-429 7677 (10767)

University of Essex

SENIOR RESEARCH OFFICER/RESEARCH OFFICER IN ELECTROMAGNETIC WAVE SCATTERING

Applications are invited for a two-year, SERC supported, research post in the School of Physics, University of Essex. The post involves research in the area of electromagnetic wave scattering, with particular emphasis on the scattering of waves from anisotropic dielectric structures. The successful candidate will be expected to give a public lecture in the subject. The appointment will be for a maximum of twelve months but could be for a shorter period. Applications are now invited for the position 1985/86. Further information may be obtained from the Registrar, University of Limerick, 20 College Road, Limerick, Ireland. Applications should be sent to the Registrar, University of Limerick, 20 College Road, Limerick, Ireland. Applications should be sent to the Registrar, University of Limerick, 20 College Road, Limerick, Ireland.

University of Kent

at Canterbury

British Telecom Postdoctoral Research Fellow - Optical Fibre Local Area Networks

Applications are invited for a Postdoctoral Research Fellowship for an investigation into the potential of optical fibre in local communication networks based on research currently being undertaken in the Electronics Laboratory. The Fellowship is for two years, with the possibility of extension for a third year at a salary on the Grade 1A scale £11,916 with placing according to qualifications and experience. The successful candidate will be expected to give a public lecture in the subject. The appointment will be for a maximum of twelve months but could be for a shorter period. Applications are now invited for the position 1985/86. Further information may be obtained from the Registrar, University of Limerick, 20 College Road, Limerick, Ireland. Applications should be sent to the Registrar, University of Limerick, 20 College Road, Limerick, Ireland. Applications should be sent to the Registrar, University of Limerick, 20 College Road, Limerick, Ireland.

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University of Liverpool

Institute of Human Ageing/Department of Psychiatry

RESEARCH ASSISTANT/RESEARCH ASSOCIATE

Applications are invited for the post of Research Assistant/Research Associate to work on a D.H.S.S. sponsored three year evaluation of a 'home care' for elderly mentally ill people. The person appointed will be expected to give a public lecture in the subject. The appointment will be for a maximum of twelve months but could be for a shorter period. Applications are now invited for the position 1985/86. Further information may be obtained from the Registrar, University of Limerick, 20 College Road, Limerick, Ireland. Applications should be sent to the Registrar, University of Limerick, 20 College Road, Limerick, Ireland. Applications should be sent to the Registrar, University of Limerick, 20 College Road, Limerick, Ireland.

University of Bradford

Chemical Engineering

RESEARCH ASSISTANTS

Applications are invited for the above posts for work in collaboration with the National Institute for Research in Chemical Engineering. The successful candidate will be expected to give a public lecture in the subject. The appointment will be for a maximum of twelve months but could be for a shorter period. Applications are now invited for the position 1985/86. Further information may be obtained from the Registrar, University of Limerick, 20 College Road, Limerick, Ireland. Applications should be sent to the Registrar, University of Limerick, 20 College Road, Limerick, Ireland. Applications should be sent to the Registrar, University of Limerick, 20 College Road, Limerick, Ireland.

University of Kent

at Canterbury

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KENYATTA UNIVERSITY COLLEGE

OFFICE OF THE REGISTRAR

PROFESSOR - ZOOLOGY DEPARTMENT - REF: KAC/3/84/3

Applications must have a Ph.D. or its equivalent in Zoology together with high level of experience in University level teaching and research. Experience in a teacher-education institution will be an added advantage. The successful candidate will be expected to teach undergraduate students, supervise the work of post-graduate students and carry out personal research. He/she will also be expected to be capable of providing academic and administrative leadership in the department. Application will be considered from persons specialising in any area of Zoology. The areas of specialisation already represented in the department are: ecology, aquatic biology (marine and freshwater biology), parasitology, immunology, arthropod biology, physiology, ichthyology, developmental biology and mammalogy. ASSOCIATE PROFESSOR - MATHEMATICS DEPARTMENT - REF: KAC/3/84/4

KENYATTA UNIVERSITY COLLEGE

OFFICE OF THE REGISTRAR

PROFESSOR - ZOOLOGY DEPARTMENT - REF: KAC/3/84/3

Overseas continued



WESTERN AUSTRALIAN ACADEMY OF PERFORMING ARTS DIRECTOR

Applications are invited for the newly established position of Director of the Western Australian Academy of Performing Arts. The Academy operates under a Board of Management within the WA College of Advanced Education and is located at the Mount Lawley Campus in Perth, Western Australia.

Students are enrolled in post-secondary courses of one to three years leading to awards of the Academy. The Academy has two principal schools - the Western Australian Conservatorium of Music and the School of Dramatic Arts (dance, theatre, media) which are directed towards the training of students in performance, teaching and production. A further function of the Academy is to develop and present an appropriate range of community programmes in the performing arts.

The Director will be responsible to the Board of Management for course development, for academic and administrative leadership in all aspects of the programme and for developing the unique ethos of the Academy in providing professional courses integrated across the performing arts. It is expected that the Director will participate in some teaching within the programme.

Applicants should have appropriate qualifications and a proven record of performance and/or teaching and/or leadership in one or more of the performing arts. Board of Management places significant emphasis on the ability of the Director to develop the quality and reputation of the Academy as an institution of international standing. It is hoped that the Director-elect of the Academy will be appointed in time to participate in the final selection of the positions of Head of the Western Australian Conservatorium of Music and Head of the School of Dramatic Arts which are being advertised concurrently with this advertisement.

Salary and Contract
The successful applicant will be appointed at the level of Head of School/Dean within the advanced education salary scales which apply throughout Australia. This salary ranges between A\$47,152 and A\$51,006 according to qualifications and experience. An increase of 2 percent on these salaries is expected followed by an increase of 3 percent in April, 1985. The term of appointment will be between five and seven years, renewable by mutual agreement. Salary and term of appointment will be subject to negotiation within these limits. The conditions of service including recreation, sickness and long service leave are those applying generally in the Australian tertiary sector. Provision is made for conference attendance and professional experience leave. Removal and settling-in allowances are available. The date of taking up the appointment is negotiable but it is hoped that the Director will assume duties no later than 1st January 1985.

Further Information
Persons indicating interest in applying for the position will be supplied with a detailed statement of conditions of service and a statement of the objectives, functioning and development of the Academy.

Applications
Request for further information and the format of application should be addressed to:
Dr R.L. Vickery
Chairman, Board of Management
WA Academy of Performing Arts
c/o Head, Personnel Department
P.O. Box 217
DOUBLEVUE, WA. 6018
Telephone: (09) 387 9273.

Applications should be completed and forwarded to the above address by no later than 28 September, 1984.



UNIVERSITY OF CAPE TOWN School of Architecture and Planning Two Senior Lectureships/Studiomasters

Applications are invited for the above TWO posts, vacant from 1 January 1985.
Candidates should be experienced in the Theory and Practice of Architecture. They should be Registered Architects or Graduates with the equivalent of a Bachelor of Architecture Degree, with teaching experience of either Undergraduate or Postgraduate level.
The successful applicant will be responsible to the Director of the School for the organization and implementation of STUDIOWORK programmes and will be required to lecture in some of the following courses: DESIGN THEORY, HISTORY OF ARCHITECTURE, CONSTRUCTION TECHNOLOGY, DEVELOPMENT ISSUES or ARCHITECTURAL PRACTICE.

One of the above posts will be based towards the teaching of Construction Technology and the successful applicant will be required to co-ordinate lectures and to lecture in various aspects of construction technology.

The other post will be based towards the teaching of professional practice and documentation in addition to instruction in Studio work. Appointments, according to qualifications and experience, will be made on the salary scale R18 657 x 938 - R24 045 per annum, plus a pensionable allowance of 12% of the basic salary, with an annual bonus of nearly one month's salary and attractive staff benefits. Increases in these salaries are expected during 1984.

Applicants should submit a full curriculum vitae and the names and addresses of three referees not later than 30 October 1984 to the Registrar, (Attention: Appointments Office), E/4813, University of Cape Town, Private Bag, Rondebosch, 7700, South Africa. Further information may be obtained from the Registrar or The Secretary, SA Universities Office, Clarendon House, 278 High Holborn, London WC1E 7HE.

The University's policy is not to discriminate on the grounds of sex, race or religion. Further information on the implementation of this policy is obtainable on request.

Grants

THE BRITISH ACADEMY Research Awards 1984-5

Applications are invited for grants to support research within the humanities and social sciences from the following research funds administered by the British Academy:

- 1. Personal Research Grants**
(a) Small Grants in the Humanities
(Applications restricted to staff of universities or other institutions of higher education in the United Kingdom. Maximum grant £2,000.)
(b) Other Personal Grants
(All persons normally resident in the United Kingdom eligible to apply. Grants cover whole field of the Humanities and Social Sciences.)
Closing dates: the end of September, December, February and April.
(c) Larger Personal Grants
(Applications restricted to staff of universities or other institutions of higher education in the United Kingdom. A limited number of grants available. Maximum grant £10,000.)
Closing date: 30 September.

- 2. Collective Research Grants**
(For group research projects; work conducted on behalf of academic institutions, societies or other learned bodies; expeditions involving fieldwork; archaeological excavations.)
Closing date: 31 September.

- 3. British Academy Overseas Exchange and Special Programmes**
(Special programmes relating to research in the USA, East Europe, West Europe, China and Japan. A limited number of travel grants are available for speakers at overseas conferences.)
Closing dates: the end of September, December, February and April (except for applications to visit China, which must be received by 1 September and 1 March).

Thank-Offering to Britain Research Fellowships
Closing date: 31 March.

Applications should relate to original research at a post-doctoral or equivalent level; persons who are normally resident in the United Kingdom are eligible to apply. Consideration cannot be given to funding research directed towards obtaining an academic or professional qualification.

Further details and application forms may be obtained from The Secretary, The British Academy, 20-21 Cornhill Terrace, London NW1 4QP; Tel: 487 5888.

**FOR DETAILS OF ADVERTISING
IN THE T.H.E.S. PLEASE RING
BERNADETTE ALEXANDER ON
01 - 253 3000, EXTN. 227.**

UNIVERSITY OF KUWAIT

Health Science Centre Faculty of Allied Health Sciences and Nursing Appointments in Medical Laboratory Technology, Physical Therapy and Radiologic Sciences and Nursing.

Applications are invited for the following appointments in the Allied Health Sciences and Nursing programmes. These are University-based degree programmes, with practical training carried out in the Hospitals of the Ministry of Public Health. The language of instruction is English.

Academic Director in Diagnostic Radiography
Academic Director in Nuclear Medicine
Assistant Director in Radiography
Assistant Director in Medical Laboratory Technology (2)
Assistant Director in Physical Therapy
Assistant Director in Nursing (Community Health Nursing)
Clinical Instructor in Physical Therapy (male)

Requirements
The staff appointed will take part in theoretical and practical teaching, and development and management of their respective programmes.

Conditions
Academic Director
Should hold a B.Sc. degree or a higher professional qualification in Radiology, plus a higher degree in a related field; be licensed to practice the profession; have at least 10 years' professional experience following qualification, including 3 years' administrative experience and 5 years full-time equivalent teaching experience; have published original work in their field; have continuing education experience.

Assistant Director
Should hold a B.Sc. degree or higher professional qualification from an approved programme or Certificate in Education with a previous professional qualification in Nursing or be a Registered Nurse Tutor; be licensed to practice the profession; have at least 5 years professional experience following qualification including at least 2 year's full-time equivalent teaching in their field; demonstrate ability to conduct research in their field or related areas; have continuing education experience or a higher degree in a relevant field.

Clinical Instructor
Must be a graduate from an approved post-secondary Physical Therapy programme; be licensed to practice; have at least 2 years experience following qualification; teaching experience preferred.

Benefits
1. Total monthly salary will be within the following scales according to qualifications and experience:
Academic Director KD 670-720
Assistant Director KD 470-520
Clinical Instructor KD 370-520
(KD 1 = 2.3 U.S. \$ 3.4 approximately)

- In addition there will be a monthly supplement of KD 100 for Academic Directors and Assistant Directors, and KD 75 for Clinical Instructors, for 10 months a year, paid by the Ministry of Public Health. There is no income tax in Kuwait, and currency is transferable without restriction.
- Academic Directors and Assistant Directors are provided with free, furnished, air-conditioned accommodation, with electricity and water supplied free of charge.
- Sixty days paid summer leave for each completed year of employment plus various national holidays.
- Staff appointed from outside Kuwait receive annual economy class return air tickets to their country of citizenship or permanent residence for themselves, their spouse, and 3 dependent children under 24.
- End-of-service gratuity of half-month's salary for each completed year of service up to 5 years, and one month's salary per year thereafter.

Applicants in the U.K. should write for application forms to the Cultural Attache, Embassy of the State of Kuwait, 46 Queens Gate, London SW7 5HR. Applicants outside the U.K. should send applications in duplicate, including full curriculum vitae, 2 recent passport photographs and the names and addresses of three referees, to:

The Dean, Department 21
Faculty of Allied Health
Sciences and Nursing
Kuwait University
P.O. Box 31470
Sulaibikhat, Kuwait

To arrive not later than 16th November 1984 (18780)

**REMINDER
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10AM MONDAY
PRECEDING
PUBLICATION**

Overseas continued



WESTERN AUSTRALIAN ACADEMY OF PERFORMING ARTS

HEAD OF THE WESTERN AUSTRALIAN CONSERVATORIUM OF MUSIC

Applications are invited for the position of Head of the Western Australian Conservatorium of Music of the Western Australian Academy of Performing Arts. The Academy operates under a Board of Management within the WA College of Advanced Education and is located at the Mount Lawley Campus in Perth, Western Australia.

The Academy offers post-secondary courses of one to three years' duration in two principal schools - the Western Australian Conservatorium of Music and the School of Dramatic Arts (dance, theatre and media) which are directed towards the training of students in performance, teaching and production.

The Head of the Western Australian Conservatorium of Music is responsible to the Director of the Academy for the professional leadership, academic programme and standards, staff management, student enrolment and welfare and financial and other management of the music programmes within the Academy.

Applicants must have appropriate qualifications and a proven record of performance and/or teaching in the field of music and have the personal qualities to provide positive leadership to the development of the music programmes. The Head of the Conservatorium will be expected to contribute to the teaching programme.

Salary and Contract
The successful applicant will be appointed according to qualifications and experience at the salary level of Principal Lecturer/Head of School within the advanced education salary scales which apply throughout Australia. The salary range is A\$39,831 to A\$47,512. An increase of 2 percent on these salaries is expected followed by an increase of 3 percent in April, 1985. The term of appointment will be between five and seven years renewable by mutual agreement. The salary and term of appointment will be subject to negotiation within these limits. The conditions of service including recreation, sickness and long service leave are those applying generally in the Australian tertiary sector. Provision is made for conference attendance and professional experience leave. Removal and settling-in allowances are available. The date of taking up the appointment is negotiable but it is expected that the Head of the Conservatorium will assume duties no later than 1st January 1985.

Further Information
Persons indicating interest in applying for the position will be supplied with a detailed statement of conditions of service and a statement of the objectives, functioning and development of the Academy.

Applications
Request for further information and the format of application should be addressed to:
Dr R.L. Vickery
Chairman, Board of Management
WA Academy of Performing Arts
c/o Head, Personnel Department
P.O. Box 217
DOUBLEVUE, WA. 6018
Telephone: (09) 387 9273.

Applications should be completed and forwarded to the above address by no later than 28 September, 1984.

T.H.E.S. Forthcoming Special Numbers

- Sept 21 - Reviews of New Journals in the Sciences
- Sept 28 - Education books
- Oct 5 - Economics books
- Oct 12 - Environmental Sciences books
- Oct 19 - Sociology books
- Oct 19 - Biological Sciences books



WESTERN AUSTRALIAN ACADEMY OF PERFORMING ARTS

HEAD OF SCHOOL OF DRAMATIC ARTS

Applications are invited for the position of Head of the School of Dramatic Arts of the Western Australian Academy of Performing Arts. The Academy operates under a Board of Management within the WA College of Advanced Education and is located at the Mount Lawley Campus in Perth, Western Australia.

The Academy offers post-secondary courses of one to three years' duration in two principal schools - the Western Australian Conservatorium of Music and the School of Dramatic Arts (dance, theatre and media) which are directed towards the training of students in performance, teaching and production.

The Head of the School of Dramatic Arts is responsible to the Director of the Academy for the professional leadership, academic programme and standards, staff management, student enrolment and welfare and financial and other management of the dance, theatre and media programmes within the Academy.

Applicants must have appropriate qualifications and a proven record of performance and teaching in one or more appropriate fields and have the personal qualities to provide positive leadership to the development of the programmes of the School. The Head of School will be expected to contribute to the teaching programme.

Salary and Contract
The successful applicant will be appointed according to qualifications and experience at the salary level of Principal Lecturer/Head of School within the advanced education salary scales which apply throughout Australia. The salary range is A\$39,831 to A\$47,512. An increase of 2 percent on these salaries is expected followed by an increase of 3 percent in April, 1985. The term of appointment will be between five and seven years renewable by mutual agreement. The salary and term of appointment will be subject to negotiation within these limits. The conditions of service including recreation, sickness and long service leave are those applying generally in the Australian tertiary sector. Provision is made for conference attendance and professional experience leave. Removal and settling-in allowances are available. The date of taking up the appointment is negotiable but it is expected that the Head of School will assume duties no later than 1st January 1985.

Further Information
Persons indicating interest in applying for the position will be supplied with a detailed statement of conditions of service and a statement of the objectives, functioning and development of the Academy.

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Chairman, Board of Management
WA Academy of Performing Arts
c/o Head, Personnel Department
P.O. Box 217
DOUBLEVUE, WA. 6018
Telephone: (09) 387 9273.

Applications should be completed and forwarded to the above address by no later than 28 September, 1984.

The Ohio State University

POSTDOCTORAL FELLOWSHIP IN METALLURGY/ELEC- TRON MICROSCOPY

The Department of Metallurgical Engineering has an immediate opening for a postdoctoral research associate in the area of materials and electron microscopy. The ideal candidate will possess a Ph.D. in Metallurgical Engineering or a related field and have experience in the characterization of defect structures in materials, with particular emphasis on interfacial structures and properties. The Fellow will contribute to a five-year research programme funded by the National Science Foundation, to study the propagation of dislocations in a variety of metals and non-metals, and will have the opportunity to work in the University's Central Electron Microscopy Facility. This is a full-time position with a salary of \$10,000 per year, plus a \$2,000 stipend for travel and other expenses. The Fellow will be expected to publish research results in the field of electron microscopy, and will be expected to give presentations at national and international conferences. The Fellow will be expected to work closely with the research group in the Department of Metallurgical Engineering, and will be expected to collaborate with the research group in the Department of Materials Science and Engineering. The Fellow will be expected to work closely with the research group in the Department of Metallurgical Engineering, and will be expected to collaborate with the research group in the Department of Materials Science and Engineering. The Fellow will be expected to work closely with the research group in the Department of Metallurgical Engineering, and will be expected to collaborate with the research group in the Department of Materials Science and Engineering.

The appointment will be for a period of one year, renewable for a second year. Salary and benefits will be commensurate with ability and experience. The Fellow will be expected to publish research results in the field of electron microscopy, and will be expected to give presentations at national and international conferences. The Fellow will be expected to work closely with the research group in the Department of Metallurgical Engineering, and will be expected to collaborate with the research group in the Department of Materials Science and Engineering. The Fellow will be expected to work closely with the research group in the Department of Metallurgical Engineering, and will be expected to collaborate with the research group in the Department of Materials Science and Engineering.

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Universities continued



Griffith University SCHOOL OF SOCIAL AND INDUSTRIAL ADMINISTRATION

Computing and Information Studies LECTURER TECHNOLOGY AND SOCIETY

The University is developing an innovative, interdisciplinary, problem-oriented undergraduate programme in Computing and Information Studies leading to the degree of Bachelor of Information Science. The first students will be admitted in 1985. Graduates from the programme will have studied both the technical and wider human, organisational and social aspects of computer-based information systems.

Applicants should have qualifications in computer science, including a higher degree, and appropriate experience in industry or commerce would be an advantage. Applicants should also have an appreciation of the role and importance of computer-based systems in society. The successful applicant will be expected to take on a significant responsibility for planning and implementing courses within the framework of the programme, as well as undertaking teaching and research.

The appointment is a continuing one. Salary, depending upon qualifications and experience, will be within the range \$42,440 to \$52,834 per annum. Benefits include superannuation and assistance with housing. Costs of fares and reasonable removal expenses will be met for appointees from outside Brisbane.

Intending applicants should first contact the School Administrator, School of Social and Industrial Administration, Griffith University, Nathan, Qld 4111, Australia (Tel: 07 275 7578), or the Secretary General, Association of Commonwealth Universities (Apsu), 36 Gordon Square, London WC1H 0PF (Tel: 01 387 5872), regarding the form of application.

The closing date for applications is 21 September 1984. (16743)

THE TIMES SUPPLEMENTS' REPRINT SERVICE BUSINESS & TECHNICIAN EDUCATION

An 8 page feature containing contributions from Mr H.N. Raine, Chairman of the Business and Technician Education Council, Sir Robert Telford, Chairman of Marconi, and Dr George Trolley, Head of Quality at the Manpower Services Commission, to name but a few. First published in THES in March 1984. Price 80p.

THES PEER REVIEW (1)
A 6 page survey that discovers how academics in seven disciplines (Civil engineering, History, Economics, Physics, Politics, Chemistry and Architecture) regard the standing of their subjects. Compiled from reports in the THES in December 1982 and August 1983. Price 50p.

THES PEER REVIEW (ii)
A 2 page survey covering Business Management, Biology, and English. First published in THES in June 1984. Price 80p.

**INFORMATION
TECHNOLOGY (i)**
A 4 page report including articles on digital drawing-boards, geographical data sifting, computer networking and computer based learning. First published in THES in March 1984. Price 25p.

**INFORMATION
TECHNOLOGY (ii)**
An 8 page report including articles on Artificial Intelligence, the imaginative use of videodiscs, remote sensing, the Alvey programme, control engineering. First published in the THES in June 1984. Price 80p.

MANAGEMENT EDUCATION
An 8 page report discussing the state of management education. Also includes 2 pages of management book reviews. First published in THES in April 1984. Price 80p. Please make cheques payable to Times Newspapers Ltd and send with your order to:
Linda Bartlett, The Times Supplement's, Priory House, St John's Lane, London EX1M 4BX.

Announcements

SCOTTISH TERTIARY EDUCATION ADVISORY COUNCIL

The Scottish Tertiary Education Advisory Council has written to organisations concerned with higher education, inviting, by 16 November 1984, submissions of evidence on its review of higher education strategy in Scotland.

The Council would also welcome views from any organisations or individuals who have not received invitations. Anyone who wishes to contribute can obtain a copy of the Council's letter and supporting documents by writing to:

The Secretary
Scottish Tertiary Education Advisory Council
Room 8/112
New St Andrew's House
Edinburgh
EH1 3SS
or telephoning 031-556-8400, Extension 4863 or 5264. (16786)